THE MEDICAL NEWS.

A WEEKLY JOURNAL OF MEDICAL SCIENCE.

VOL. 82. NEW YORK, SATURDAY, MARCH 7, 1903. NO. 10.

ORIGINAL ARTICLES.

PERIDUODENAL ABSCESS SECONDARY TO ULCER OF THE DUODENUM.*

BY WILLIAM SEAMAN BAINBRIDGE, M.S., M.D.,

OF NEW YORK.

PERFORATIVE ulcer of the alimentary tract, involving the general peritoneal cavity, has of recent years deservedly received considerable attention. Although our knowledge is still far from complete, the time devoted to the subject has already yielded some very gratifying results. With increased data earlier diagnoses have in many instances been possible, and in some cases surgery has accomplished brilliant cures. Distinct advance has been made not only in typhoid and gastric perforations, but also in duodenal ulcer. Weir points out that the mortality in cases of perforation of the first portion of the small intestine was seventy to eighty per cent. But since 1898 operations for general peritonitis and suture of the perforation have reduced this, according to the length of time between the perforation and the operative interference, to thirty-three to sixty per cent. Moynihan, and Perkins and Wallace diagnose only one case each of perforative ulcer out of fifty-one, and in eighteen of these the clinical picture was such a perfect copy of perforative appendicitis that the operation was performed with the firm belief that there was appendicular disease. Others have experienced like difficulties in reaching a diagnosis, and we must frankly admit that with our present knowledge, in the vast majority of cases, the diagnosis must be general peritonitis, with the site of the perforation undetermined.

When we turn to the form of perforative ulcer of the duodenum, which does not involve the general cavity of the peritoneum, we find there is very scant information in medical literature. The subject is dealt with rather incidentally, and many important facts are either absent or stated too vaguely to be of real value. Although this disease is comparatively rare, yet it does occur often enough to be carefully studied and kept in mind as a distinct possibility. Maydl, writing in 1894 upon subphrenic abscess, collected 179 cases, of which six were due to perforative ulcer of the duodenum. There are, including the author's case reported below, twenty-six on record.† Twenty-two of these cases died without the diagnosis being made. In two an operation was performed and the diagnosis made at the time that the abdomen was opened. A cure resulted in one (Moynihan). In another, diagnosis was accurate, operation performed, but patient subsequently died from the disease (Lowson). In still another (see author's report below) diagnosis was made, but the condition of the patient prevented surgical interference.

The purpose of this paper is to give in condensed form an epitome of the literature on the subject, to stimulate a fuller record of cases which may occur from time to time, and to urge a more general recognition of the possibility of this disease being present in daily practice, where the symptoms apparently point to a far more common disease.

The following is now reported for the first time: July 23, 1899, I was called in consultation with Dr. Charles A. Ellis, of Sherman, N. Y. The patient was fifty-four years of age, a bachelor, merchant by occupation and a native of New York State. His family history was negative, with the exception that his father died of pyloric cancer. His previous personal history was good, except for a mild attack of appendicitis thirteen months before, which lasted seven days, and recovery was apparently complete. From that time he seemed to be in good health, except occasionally experiencing slight tenderness in the right iliac fossa. He considered himself moderate in the use of both spirits and tobacco and was able to live the normal life of an active business man until the onset of the present illness.

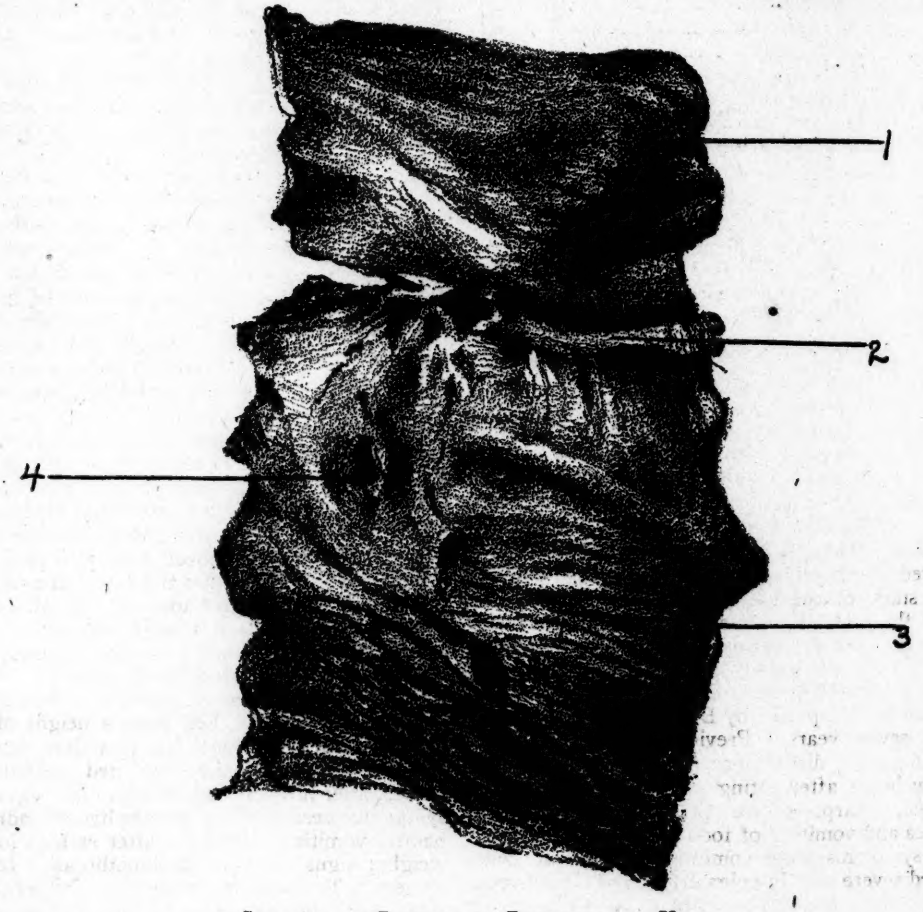
When his physician was first called on June 20, the patient seemed to be suffering from an acute attack of gastritis. It came on suddenly, beginning with severe vomiting and intense abdominal pain, following immediately upon the ingestion of a glass of ginger ale. Some hours after the commencement of the symptoms pain was still marked over the region of the stomach; there was tenderness on palpation, with considerable muscular rigidity over the ascending colon and the right half of the transverse colon. The rigidity was more marked above the level of the umbilicus than below, and the severe symptoms seemed to be more localized in the epigastric and right hypochrondriac regions. Considerable abdominal distention from intestinal gas was present. Temperature normal, pulse 84, not very strong; respiration only slightly increased in rapidity and lessened in depth. Vomiting of watery fluid, at times of yellow color, and of everything taken, occurred occasionally for two days. With a diet of milk, the use of bismuth, and the employment of digestives, all symptoms gradually disappeared. At the end of six days from the onset the patient was able to walk about, seemingly well, although somewhat weak, and on this day made a short visit to his store. When he returned home three small oranges were eaten at

* Read in part at the Ninety-seventh Annual Meeting of the Medical Society of the State of New York, held at Albany, N. Y., January 28, 1903; and in full before the Surgical Section of the New York Academy of Medicine, February 9, 1903.

† In the discussion of this paper at Albany, Elsner of Syracuse reported a case of a male, aged forty-two, with a previous history of duodenal ulcer, where he had diagnosed perforative ulcer of the duodenum with abscess. The patient's condition prevented operation. On autopsy a large subphrenic abscess was found communicating with the second portion of the duodenum.

one sitting; a few hours later vomiting began, which was frequently repeated during twenty-four hours. There was none of the very severe pain of the first attack, but epigastric discomfort and some abdominal rigidity. For two weeks rectal alimentation was employed, the stomach having perfect rest. On the fifteenth day food in small quantities was administered, and was retained by the stomach. By July 7, fluid and soft diet, with the use of liquid peptonoids, were being constantly employed, yet the patient's strength seemed to diminish and emaciation progressed.

On July 23, I found the patient markedly emaciated, somewhat cachetic, and the skin and conjunctivæ slightly icteric, temperature normal, pulse weak. The bowels, early in the attack constipated, were now loose. There was some tenderness and slight resistance in the region of the pylorus and the hepatic flexure of the colon. The liver was large and tender, its lower margin extending about three fingers below the free border of the ribs. Some resistance and pain on pressure over the appendix was manifest, and a small mass in this region could be apparently felt. The diagnosis was made either of cancer in the neighborhood of the pylorus, possibly involving the liver, or more probably of perforating duodenal ulcer, with secondary abscess formation. The appendicitis was considered an old lesion with some acute congestion. The condition of the patient at the time precluded the possibility of any operative interference. Accordingly, it was decided to make every effort to secure temporary improvement, with the hope that an exploratory operation might be undertaken. There was no difficulty in regulating the bowels, and apparently none in having a sufficient amount of food retained, but steady emaciation and loss of strength, with increased cachexia, continued. For a few days, by forced rectal feeding and with the use of predigested foods by mouth, a slight gain was made. But this was insufficient; again he gradually began to lose ground and died of exhaustion the last of August, the eleventh week from the onset of the symptoms. Only twice was there any temperature, and that followed a slight chill,



1. STOMACH. 2. PYLORUS. 3. DUODENUM. 4. ULCER.

the second and sixth week of the illness. At times his temperature was subnormal.

On autopsy, performed within a few hours after death, I found the following conditions: Many adhesions about the pylorus and duodenum, as well as between stomach and posterior abdominal wall; a small ulcer in the duodenum, one-quarter of an inch in diameter, with its edges everted.

The ulcer, as shown in the photograph, which was taken from an exact drawing of the specimen, was on the posterior wall an inch and a quarter from the pyloric valve. It communicated by a small opening with an irregular sac filled with almost a quart of greenish fetid pus. The abscess cavity was irregular and completely shut off from the general peritoneal cavity. It had involved the head of the pancreas, extending behind the stomach to the left, working downward underneath the transverse mesocolon, and dissecting between the folds of the base of the mesentery. At the attachment of the mesentery, entirely extraperitoneal, was at least a cupful of greenish pus. This communicated with the rest of the pus sac through a narrow channel, the walls of which were covered with necrotic tissue. A small arm of the abscess passed downward, external to the psoas muscle and posterior to the colon. This extended almost into the right iliac fossa, although the appendicular trouble was entirely shut off and independent. The appendix was enlarged, turned upon itself and bound down by many adhesions. A small amount of turbid serum with fecal odor was seen between some of the adhesions. There was also recent general acute peritonitis, apparently of only a few hours standing. The liver was large and the kidneys showed considerable parenchymatous nephritis.

A study of the literature on this subject reveals the fact that there are only about eleven cases reported sufficiently to be of scientific value in a comparative study of this disease, and in some of these important data have been omitted.

Case I.—(Reported by Bouchard.) Male, aged thirty-seven years. Previous personal history was digestive disturbance for a month; noticed a few hours after eating. Onset of attack was sudden, sharp, severe pain in epigastrium; nausea and vomiting of food and bile. The signs and symptoms were vomiting, obstipation, continued severe pain in epigastrium and right hypochrondrium, inability to obtain easy posture; swollen abdomen. After a few days icterus developed. Temperature, slight until late in the disease, then high.

Diagnosis.—Inflammation of gall passage. Pleurisy with effusion later, when higher temperature appeared. Patient was in hospital, but no treatment was mentioned. The course of disease showed impovement. Left hospital. Returned in two weeks very weak and much emaciated. Died day after readmission. From onset of first severe symptoms to death about three weeks.

Autopsy.—Fresh general peritonitis; intestinal adhesions; beneath diaphragm a large empty pus cavity; perforation of the duodenum one and a quarter inches in diameter near the pylorus.

Case II.—(Reported by Chauffard.) Male, aged thirty-three years; uncertain previous personal history of digestive disorders. Two days before admission to hospital there was sudden pain in right hypochondrium. Obstipation. General weakness. Swollen abdomen. No vomiting for two days. Icterus and temperature were not mentioned.

Diagnosis.—Perforative peritonitis. Purgatives were given without effect for two days. The course of disease ran for two days after admission, then sudden emesis with purgation. Death followed immediately.

Autopsy.—Intestines were distended with gas; many firm adhesions; large subphrenic abscess, connecting with the duodenum by a perforation one inch from the pylorus.

Case III.—(Reported by Pfuhl.) Female, twenty-three years; previous personal history was general weakness one month, slight chills and fever, pain in epigastrium and right hypochondrium; anorexia. The onset of attack was sudden, sharp, shooting pain in right side of thorax, behind, increased by breathing. The right hypochondrium was slightly enlarged and painful on palpation. Several severe chills. Icterus not mentioned. Temperature at onset was 101.3° F., gradually increased to 104° F.

Diagnosis.—Right pleurisy with effusion; several days later, right pneumothorax with characteristic signs. The treatment was puncture in fifth interspace. Thick pus containing fat crystals. The course of disease was short. So much pus evacuated that heart moved back into place and patient died in ten minutes from time of puncture.

Autopsy.—Omentum adherent to abdominal wall and posterior to it a large pus cavity. Also a subphrenic abscess size of a child's head.

Case IV.—(Reported by Pusinelli.) Male, aged thirty-three years. Previous personal history not mentioned. Fell from a height of five feet; abdomen injured; for two days kept at work; pain developed; vomited bile-stained masses after meals; went to bed. The signs and symptoms were swelling in right hypochondrium; painful vomiting, continued after eating; loss of weight; signs of right pneumothorax. Icterus present. Temperature 101° F. Neither diagnosis nor treatment were given. On the third day air was detected in swelling of right hypochondrium; fifth day vomited dark gray masses, not lung tissue; died on tenth day.

Autopsy.—Diaphragm pushed up to level of third rib on right side, adherent to base of lung. Subphrenic abscess cavity filled with air. Narrow channel connected this with second abscess the size of an apple, which opened into duodenum just at the pyloric orifice.

Case V.—(Reported by Nowak.) Female, aged forty-five years; past two years slight nausea and occasional vomiting. The onset of attack was sudden, sharp pain in right side and dyspnea. The signs and symptoms were cough,

pain in right axilla, emaciation, heart slightly displaced to left and signs of right lung compression, abdomen tender, liver dulness to three fingers below free border of ribs. Neither icterus nor temperature were mentioned. Diagnosis not given. Treatment was exploratory puncture between seventh and eighth ribs on right side, and proved negative. Ten to twelve days after onset patient vomited and coughed up large quantities of foul pus; thereafter for the next four months, small quantities of pus came away. Five days after puncture fat crystals were found in sputum. Diarrhea set in, stools containing mucus and small blood clots. One month later collapse and death.

Autopsy.—Old cholelithiasis; large right subphrenic abscess; perforation of duodenum near pylorus; perforation of a gastric ulcer; recent dysentery.

Case VI.—(Reported by Perry and Shaw.) Female, aged forty-eight years; no previous personal history. While eating, violent cramp-like pain in epigastrium. Diarrhea at end of a week which continued. Kept on left side or back. Pain in any other position. Liver large. Indefinite tumor near umbilicus. No icterus was mentioned. Temperature was normal. Neither diagnosis nor treatment were mentioned. The course of the disease was continued diarrhea, emaciation, weakness. One month after attack she passed six ounces of blood in stool for three days, then died.

Autopsy.—Abscess between enlarged liver, anterior abdominal wall and intestines communicating with transverse colon by a small recent perforation and with the duodenum on its posterior wall by a large circular perforation with smooth edges. Large chronic gastric ulcers.

Case VII.—(Reported by Lennander.) Female, aged fifty-four years; was well until five years ago, dyspeptic; habitual constipation. One year before onset bloody stool with nausea and vomiting. Onset of attack sudden severe pain in abdomen; marked resistance felt in epigastrium. No signs or symptoms were stated. Nothing said about icterus. Neither temperature nor diagnosis mentioned. Treatment, two weeks after onset by an incision through the right rectus, a number of small abscesses opened. Perforation found deeper, supposed to be in pylorus, as gas and stomach contents were seen issuing from it. Sutured. Eight gall-stones removed. The course of the disease was not given.

Autopsy.—Sutured perforation in duodenum to right of pylorus on anterior aspect; another found on posterior wall.

Case VIII.—(Reported by Fenwick.) Male, aged nineteen years. Previous personal history showed heavy drinker. Vomiting began two days before accident. Falling twelve feet on to abdomen was the cause of the onset of attack. Vomited everything taken. Pain in right inguinal region. Symptoms of shock; constipation; fulness in right inguinal region; typhoid condition set in. Icterus not mentioned. Temperature on admission was 100.4° F. Diagnosis not mentioned. Treatment, after readmission, laparotomy; large amount of pus from right groin evacuated; later, incision allowed much fecal matter to escape. The course of disease was that patient gradually improved from typhoid condition and left hospital one month later; readmitted in five weeks much emaciated; found fluctuating mass in right groin; bowels moved freely. Three or four months after second operation diarrhea set in and in another month death followed from exhaustion.

Autopsy.—Body greatly emaciated; abscess channel from Poupart's ligament to under surface of liver communicating with perforation; ulcer duodenum one-half inch in diameter 5½ inches from stomach.

Case IX.—(Reported by Pegram.) Male, aged fifty-six years; ten years ago had stomach trouble; well since then. After hearty meal general dull pain in abdomen. Next day pain increased markedly. Localized in right hyphochondrium. Signs and symptoms were constipation; frequent emesis; abdomen flat, rigid, very tender. Icterus not noted. Neither temperature nor diagnosis mentioned. Treatment was laparotomy. Perforating ulcer anterior wall of duodenum near pylorus with subphrenic abscess. Pus evacuated. Ulcer walled off with gauze. Thirty-six hours after operation patient died.

Autopsy.—Ulcer and abscess as above; also scar of healed ulcer posterior surface of duodenum. General peritonitis.

Case X.—(Reported by Lowson.) Female, aged fifteen years; one month before onset pain in left side; two weeks later chills, depression and cyanosis about lips and nose. Profound collapse came on a few days later with severe pain to left of umbilicus. Abdomen distended; breathing shallow and frequent. Below liver, to the right of median line, was a painful swelling of considerable size. Next day swelling disappeared after patient had vomited a large quantity of foul-smelling matter. Icterus not mentioned. Increased temperature. Diagnosis was perforative duodenal ulcer. Laparotomy was performed; gas and pus evacuated from a subhepatic abscess connecting with a perforation of the duodenum. Suture of perforation and drainage of abscess. Three days after collapse vomited bile, which continued for five days; temperature increased; pulse rapid and feeble; abdomen distended.

Autopsy.—There is no information concerning the after-history of this case; autopsy is not mentioned, but the deficiency of the article makes it almost certain that death occurred within a few days after the operation.

Case XI.—(Reported by Moynihan.) Female, aged twenty-nine years. Previous personal history is several attacks of pain and vomiting during last five years. Blood at times appeared in the vomitus; sense of discomfort one to five hours after meals. With one attack light tem-

perature, emesis, tenderness in right hypochondrium and severe pain to right of umbilicus. Signs and symptoms were not mentioned, neither was icterus. Temperature 104° F. Diagnosis was made during operation. Laparotomy on eighth day; adhesion about duodenum, gall-bladder and pylorus; abscess between duodenum and liver; duodenal wall thickened with perforating ulcer at juncture of first and second portions. Tube and gauze drainage. Recovery within one month.

Case XII.—(Reported by Bainbridge.) See full report as given above.

Anatomy.—The duodenum is practically a fixed organ, and, while apparently safe, because of its close relation to the spine and right kidney, is really in greater danger than other organs more superficially placed.

The site of the ulcer, in relation to the peritoneal covering of the duodenum, determines largely the subsequent history of the case. The first portion of the duodenum is usually about two inches long, and the peritoneum, except for a small extent of its posterior surface where the neck of the gall-bladder is in close relation, entirely encircles it. The second or descending part is from three to four inches long and covered only on its anterior aspect by peritoneum. This anterior surface is divided into supra- and infracolic portions by the passage from side to side of the transverse mesocolon. Thus, when the perforation is in the first part of the duodenum the chances are largely in favor of its causing general peritonitis. When the ulcer perforates through the supracolic surface of the descending portion the intestinal contents will be discharged onto the upper surface of the mesocolon. It may then follow down the ascending colon toward the right iliac fossa, not infecting the general peritoneal cavity, being walled off for some time by newly formed adhesions. Murphy and Neff have given this as a reason why perforative appendicitis is so often simulated. Perforation of the posterior wall, wherever uncovered by peritoneum, will give retroperitoneal abscess. Maydl states that he has never found perforations leading to subphrenic abscess more than three centimeters from the pylorus. Laspeyres gives the anterior wall of the upper horizontal portion as the most common site for perforation. Oppenheimer has collected data concerning five cases where the pancreas was involved. The perforation, when it involves the general peritoneum, is usually acute, but there have been a few instances where the process was more gradual and adhesions shut off a localized purulent peritonitis.

Symptoms.—Little can be added to what has been given above. The most frequent symptoms are vomiting, pain, tenderness and resistance in the epigastric and right hypochondriac regions, constipation or obstipation, sudden onset and shock. Many patients cannot lie on the right side, such a position causing more pain. Usually there is a previous history of gastric or intestinal disturbances. A number of cases have followed a direct injury to the abdomen or some severe physical strain.

Melena or hematemesis are not common. They occur more frequently in ulcer than in abscess. Laspeyres says "thirty-three per cent. of duodenal perforations bleed and are very often fatal." Oppenheimer cites twenty-four such cases.

Temperature, as a rule, if present at all, is slight. Complications may develop and give rise to fever.

Complications which are mentioned as having occurred.—General peritonitis, dry pleurisy and pleurisy with effusion, empyema, pneumothorax, pyopneumothorax, cholecystitis, cholelithiasis, ulcer or perforation of the stomach, infarction of various parts of the body, such as lung and duodenum, pancreatitis, perforation of the diaphragm and lung.

Diagnosis.—Found more frequently in the male than in the female. Fenwick's proportion, as given for ulcer, of ten to one, is too high. Of the twenty-seven cases of abscess recorded, including Elsner's, sixteen are males, ten females and one the sex not stated.

Occurs in young or old. Brooks reports a girl of twelve years, Pegram a man of fifty-six, Perry and Shaw a woman of sixty.

The following must be specially thought of in connection with this disease—empyema, pleurisy with effusion, cancer of pylorus or liver, pyopneumothorax, hydatid cyst, hepatic abscess, intestinal obstruction, disease of the gall-bladder or its ducts, and appendicitis. Of all the conditions which periduodenal abscess simulates, next to general peritonitis, appendicitis is the most frequent. Mackenzie says he has "not met with an appendicitis case giving rise to general peritonitis, where there was a history of repeated attacks of pain, but duodenal ulcer does give these attacks."

Blood examination for leucocytosis may be of assistance when cancer or some other non-purulent condition is to be excluded. The diagnosis is always difficult. If symptoms have indicated the presence of ulcer (pain in stomach two to six hours after eating, point of tenderness to the right of the twelfth dorsal vertebra, vomiting specially hematemesis), and if sudden severe pain, marked increase of vomiting, or collapse appears, operation is imperative.

Exploratory laparotomy should be resorted to when abscess is probably present.

For those who may desire to review the literature on this subject further than the limits of this paper will allow, a complete bibliography is appended.

LITERATURE.

Bouchard—Bulletin de la Soc. Anatomique, 1862.
Chauffard—Gazette des Hospitaux, 1871, p. 373.
Pfuhl—Berlin klin. Wochenschrift, 1877, No. 5.
Sanger—Arch. für Heilkunde, 18 Jahrg., 1876, p. 247.
Leyden—Zeitschrift für klin. Med., 1880, Bd. I.
Weichselbaum—Ber. d. k. k. Krankenanstalt—Rudolph Stiftung, in Wien (1883), 1886, 431.
Pusinelli—Berlin klin. Wochenschrift, 1887, p. 362.
Falkenhain—Mittheilungen aus der Königsberger med. Klinik, 1888, p. 211.

Mackenzie—Lancet, Dec. 1, 1888, p. 1060. "Special Diagnosis in Acute Perforative Peritonitis."
Scheurlen—Charite Annalen, 1889, Bd. XIV.
Nowak—Die Hypophrenische Empyeme, Schmidt's Jahrbücher, 1891, Bd. 232, p. 73.
Leyden and Renvers—Berliner klin. Wochenschrift, 1892, p. 156.
Oppenheimer—Das Ulcus pepticum Duodenale, Würzburg, 1892.
Perry and Shaw—Guy's Hosp. Reports, 1893, p. 271.
Biggs—Proc. N. Y. Path. Soc., 1893, 67-69; Med. Record, 1893, Vol. XLIV, p. 825.
Lockwood—Lancet, Oct. 27, 1894, p. 968.
Pilcher—Annals of Surgery, July, 1894.
Maydl—Ueber subphrenische Abscesse, Wien, 1894.
Burdick—N. American Pract., Chicago, 1895, Vol. VII, 28.
Festal—Journal de Med. de Bordeaux, 1895, p. 770.
Landerer and Glücksman—Mittheilungen aus der Grenzgebiete d. Med. u. Chir. Jena, 1896, I, 168, 738.
Lennander—Beiträge zur klin. Med. u. Chir., Heft 9.
Lennander—Mittheilung aus d. Grenzgebiet der Med. u. Chir., 1899, Bd. IV, p. 91.
Pagenstecher—Deutsche Zeitschrift für Chirurgie, 1899, Bd. 52, p. 541.
Mühsam—Beiträge zur differential Diagnose der Appendicitis, Berlin klin. Wochenschrift, 1899, No. 36, p. 676.
Brooks—Med. Record, 1899, Vol. LVI p. 943.
Brooks—Med. Record, Dec. 23, 1899, p. 943.
West—Clin. Soc. Trans., Vol. XIX, p. 113.
Fenwick—Ulcer of the Stomach and Duodenum, 1900, p. 334.
Poynton—Brit. Med. Journal, Feb. 17, 1900, p. 383.
Grivot et Aguinet—Bull. et mem. de la Soc. Anatomique, Paris, 1900, Vol. 75, p. 930.
Bolton—Med. Record, March 24, 1900.
Kinnicutt—Festschrift, A. Jacoby, May, 1900.
Pegram—Boston Med. and Surg. Journal, Dec. 27, 1900.
Weir and Foote—Med. Record, May 5, 1900.
Labbé—Bull. et mem. de la Soc. Anat. Paris, 1901, Vol. 76, p. 407.
Lowson—Lancet, May 11, 1901, p. 1341.
Moynihan—Lancet, Dec. 14, 1901.
Laspeyres—Centralblatt für die Grenzgebiete der Medizin u. Chirurgie, Jan., Feb., March, 1902.
Murphy and Neff—N. Y. Med. Journal, Sept. 20 and Sept. 27, 1902.

MOSQUITO EXTERMINATION IN NEW YORK CITY.

BY GEORGE A. SOPER, PH.D.,
OF NEW YORK;
FORMERLY SANITARY ENGINEER OF THE DEPARTMENT OF HEALTH.

BEFORE deciding on the means to be followed to get rid of mosquitoes in any locality, I believe it is a wise plan to give a good deal of attention to the particular kinds of mosquitoes to be dealt with and the circumstances under which they occur. In some places where this precaution has not been taken, extensive work has been done against mosquitoes which later investigation showed gave little trouble, while the insects which were the true offenders were overlooked.

To avoid the possibility of mistake, I advocate a careful observation of the times and places where the mosquitoes occur and the collection and identification of many specimens. From these facts a correct knowledge can be had of the location and kinds of breeding places which need to be destroyed.

In New York City there are several types of mosquitoes which, in my view, it is desirable to consider separately. One of these is the sordid mosquito, *Culex pungens*, the mosquito which is most apt to give trouble indoors at night. Another is the *Anopheles maculipennis* which has been found to be an agent by which malaria is carried from person to person. A third is the *Culex sollicitans*, more commonly known as the salt marsh mosquito. This insect bites by day and night, but is most commonly troublesome in the open air on calm days near the tide meadows.

It is a common belief among New Yorkers that such mosquitoes as occur on Manhattan Island come from New Jersey, the extensive breeding grounds on the Hackensack meadows, and the nearness of that celebrated region making this supposition seem probable.

To test the matter, several hundred mosquitoes were caught last summer along the western water front, and elsewhere in Manhattan, and their species determined. It was known that the characteristic Jersey mosquito was the *Culex sollicitans*, and as the conditions on Manhattan Island for the breeding of these mosquitoes were not favorable, it was thought that if the *sollicitans* were present in large proportion, some color would be given to the theory that they came from across the river. When the examinations were finished, it was found that the mosquitoes caught were almost exclusively of the species *Culex pungens*.

It is well known that *Culex pungens* is not a salt marsh mosquito, but one whose larvæ often develop in stagnant water near habitations. A consideration of this fact led to a search for breeding places in Manhattan. The result was that the larvæ of *Culex pungens* were found in nearly all parts of the island. Wherever a trench or the foundations for a building were being made, or, in fact, pools of stagnant water from any cause existed, the eggs, larvæ and pupæ of the sordid mosquito were pretty certain to be discovered. In some cases other larvæ, notably those of the malaria mosquito, were found in the same water with *pungens*.

Stagnant Water and Sunken Lots in Upper Manhattan. The company advertising is said to own one thousand lots of this type.

As might be expected, the excavations for the underground rapid transit railway afford ideal conditions for the propagation of *Culex pungens*. For many miles through the heart of the city, at the bottom of this trench, there are pools that are sheltered from wind and light. The number of mosquitoes which breed in these pools is incalculable. Probably hundreds of thousands are hatched out every warm day.

It would be profitable to know what becomes of the great number of mosquitoes hatched in New York in the summer time. In view of the extent and rapidity with which they multiply, it may seem curious that a plague of the insects has not visited the city. A partial explanation perhaps is,

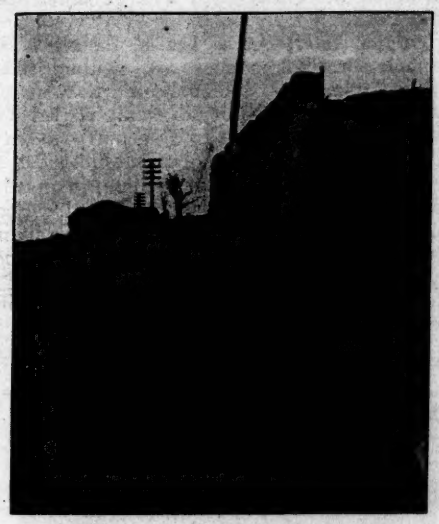
that most of the mosquitoes which come from the stagnant water in the built-up portions of the city do not find the conditions in the neighborhood favorable to their continued existence, and so perish at an early stage of their career. It is also probable that a large part of the larvæ fail to become strong-winged insects. Of those able-bodied mosquitoes which do emerge from the water, a considerable proportion are males, and as these do not bite human beings, they are not noticed. Those which remain are comparatively few.

The sordid mosquito is seldom observed in New York in the daytime, but at twilight it emerges from its hiding place. If an entrance to a dwelling cannot immediately be effected it flies upward, searching diligently along the sides of the houses for an opening. I have observed *Culex pungens* in considerable numbers night after night, beating upon the screens of windows at a height of over a hundred feet from the ground. Failing to get in they would disappear over the

Stagnant Water in Jerome Park Reservoir. Borough of Bronx.

top of the house. Their fate beyond this point is beyond conjecture. I have never seen them fly downward.

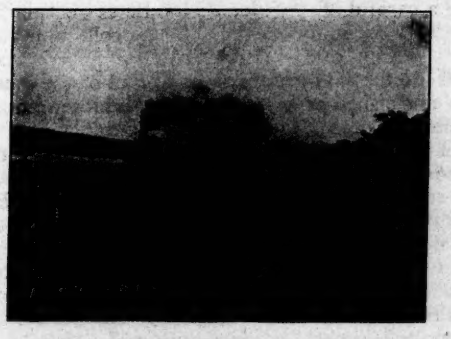
The breeding places of the sordid mosquito in New York are by no means confined to the built-up portions of Manhattan, but occur with equal frequency in the rural districts of the city. Few people have any idea how extensive these rural districts are. New York, as a whole, is not a crowded city; only 1,000 acres have a population of 250 persons or more to the acre. The average population per acre in Manhattan, as shown by the last U. S. Census, is 147.1 and the average for the whole city is less than 17. There are large stretches of country which have none of the attributes of city or even village life. Adding up some of these tracts, and comparing them with the total area of the city, we find that about 80 per cent. of the territory of New York has a population of less than 20 people to the acre and that there are 93,000 acres which have a smaller average population per acre than 1.6. New York is, in fact, a collection of communities. The group includes two great cities, several small cities, a large number of towns and villages and an extensive area of strictly rural country.



Imperfect Drainage on a Railway. Malaria Mosquitoes found here. New York Central Railroad, near 148th Street and Hudson River.

Throughout this large territory mosquitoes are more or less of a nuisance.

Excluding water due to engineering works and natural pools and swamps, most of the breeding places of *Culex pungens* are due to a want of proper order and neatness about dwellings. As its name implies the sordid mosquito is not fastidious about its breeding places. Rain water in discarded buckets, butter tubs, cement or flour barrels, paint pots, broken dishes or boxes serve the insects well. The water in which the larvæ occur is often as foul as can be imagined. The



On the Hudson. Pool produced in constructing the railroad.

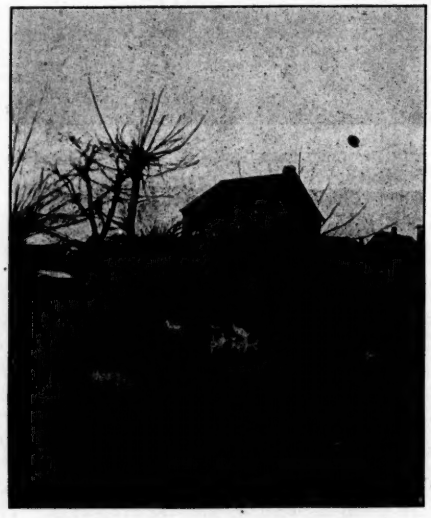
presence of garbage, manure and human feces actually seems to favor their growth.

The larvæ of the sordid mosquito have been met with in New York as early as May and as

late as the middle of November. The winged insects evidently live all winter in some houses. On Jan. 15 last, I caught two adult females on the wing in the corridor of a large hotel near Central Park.

From the standpoint of health, the most objectionable breeding places are neither those found in the densely populated nor wholly urban localities, but in the vicinity of thinly settled districts which are passing from country to city. Here the malaria mosquito occurs; in most of these regions the drainage of the land is unsatisfactory; sanitary matters are neglected. Poor people are attracted to such places because living is cheap. Under such circumstances it is not strange that malaria should be prevalent.

The construction of public works is a prolific cause of malarial and household mosquitoes in New York. At the edges of the built-up sec-



Imperfect drainage due to highway construction, Concord, Staten Island.

tions of the city new grades are constantly being established and streets, with their sewerage, water and gas systems are being built. The building lots adjoining the new streets are left, in many instances, at a much lower grade than the surrounding highways. In these low places, locally termed "sunken lots," water accumulates in pools, and in the pools mosquitoes multiply.

In the course of time, as the value of the land increases, the sunken lots are filled and built upon and the stagnant pools eliminated, but meanwhile they are a source of annoyance and illness.

The railways which enter New York add to the prevalence of mosquitoes of the *Anopheles* and *Culex pungens* kinds by affording breeding places on their rights of way and by interfering with the drainage of contiguous property. It is the ultimate destiny of most railroads in New York to run in subways or open cuts with masonry walls at the sides and roofs or bridges overhead. Drainage will be provided for by deep underground conduits, and no water will stand on the right of way even in rainy weather. There are several miles of this kind of railway already built in the Borough of the Bronx and an excellent section in Manhattan. The work is expensive, and the progress being made in converting old lines into this new form of construction is slow.

In the more remote suburban districts conditions are often favorable to the *Anopheles maculipennis* and malaria is common. Apparently malaria mosquitoes have a preference for places which are protected from the wind, like hollows, cloves and glens, and it is among the residents of settlements in such situations that malaria is most likely to occur. The larvæ of *Anopheles* has been found in the shallow water of woodland marshes, fresh-water ponds and swamps, spring lands and sluggish brooks. In the partly built-up sections of the city the larvæ of malaria mosquitoes have frequently been met with in water in excavations, beside railroads and highways, in lakes, artificial streams, and in discarded receptacles such as butter tubs, boxes and barrels.

Beside the mosquitoes referred to, there is the third kind which causes a great deal of annoyance in some localities. This is the *Culex sollicitans*. This insect, most often called the salt water mosquito, occurs almost exclusively in those portions of New York which lie near the tide meadows. There are about 40 square miles of meadows in the city. About 150,000 acres of land are visited by the *Culex sollicitans* in great numbers. The number of people affected is considerable, for although there is an average of only 1.8 persons per acre in the regions most seriously concerned, there are numerous seaside parks and residence settlements near the edges of the salt marshes where the inhabitants and visitors are frequently annoyed by mosquitoes.

As is now well known, the salt-marsh mosquitoes breed for the most part in the stagnant pools of brackish water which lie within a few hundred feet of the uplands at the edges of the tide meadows. These pools receive rain—and occasionally some surface water, and are overflowed at unusually high tides. As a rule they have no outlets.

It is remarkable to observe to what extent tall grass acts as a shelter for salt marsh mosquitoes, as indeed do trees, thickets, hedges and shrubbery. The lower and thicker the vegetation, the better the protection. The dense woods, thickets and shrubbery so often seen along roadsides and close to dwellings, keep enormous supplies of mosquitoes constantly at hand.

If the people of New York seriously want to get rid of their mosquitoes, there are many circumstances to favor them. Not the least of these lies in the fact that the Board of Health has taken an interest in mosquito extermination as a step toward the prevention of malaria. In the summer of 1901 resolutions were passed by the Board to the effect that all institutions and the

physicians of the city be requested to furnish the Board with information in regard to patients suffering from malarial fever under their care, and that circulars on the cause and prevention of malaria be mailed to the addresses at which malarial infection had apparently been contracted. In the summer of 1902 experiments were undertaken into methods of destroying larvæ, and extensive biological and sanitary surveys were made to determine the kinds, location, extent and proper remedies for the breeding places. Some steps were taken toward applying legal remedies for unsanitary conditions which favor mosquito propagation. It was announced by the president of the Board of Health in an address delivered before the Civic Club, Feb. 7 last, that this year the work of mosquito extermination would be pushed upon the approach of warm weather.

In setting out to exterminate mosquitoes, the Board of Health has taken up a large work, for the extermination means the elimination of stagnant water, and there is hardly an acre of the 327 square miles of Greater New York which has not some standing water upon it. Nevertheless, ample power is given to the Board to deal with this subject in a comprehensive manner, and by announcing that war is to be waged against all persons who are responsible for stagnant water, a warning has been given that this power is to be used in a vigorous manner.

Considerations of health, no less than of personal convenience, should prompt property holders and others to yield a willing compliance to the purpose of the Board. It will generally be found easier and cheaper to correct the unsanitary conditions voluntarily than to do so after being prodded into action by legal proceedings.

For those who wish to be rid of mosquitoes the first thing to be done is to see that the yards and grounds in the vicinity of their houses are put in good order. Useless receptacles which will hold water should be destroyed; tubs and barrels which have outlived their usefulness should not be cast out upon a rubbish heap, but be broken up for firewood. There should be no rubbish heap. Rain barrels and cisterns, if indispensable, should be stocked with gold fish or covered with mosquito-proof screens. Cesspools and manure pits to which mosquitoes can gain access should have enough kerosene oil thrown into them to keep their surfaces completely covered.

For the elimination of pools of limited extent which occur on private property, no remedy is so suitable as earth filling or drainage. Often a few barrowfuls of earth, taken from a nearby point, will put an end to a focus of mosquitoes for all time. Frequently the opening of an obstructed drain or brook, or the cheap construction of a proper outlet to a pool, will give vent to an accumulation of stagnant water which has been a source of annoyance for a long time. The margins of brooks and ponds should always be sharp and clean and as free as possible from weeds. Green scum and other algal growths indicate conditions which are favorable to malarial mosquitoes. In the correction of pools I do not regard the use of oil as suitable for any but pressing needs. It can afford, at best, only very temporary relief. Its best use is to stop the hatching of mosquitoes in a pool until the latter can be eliminated.

The pools and puddles formed in the course of building operations could be largely avoided if contractors would use care in avoiding the formation of unnecessary accumulations of water. Such a universal neglect of public health and convenience as is to be seen wherever building operations are in progress in New York can only be justified on the supposition that the contractors have not been aware that they were creating nuisances. Proper and simple ways to avoid forming stagnant water in excavations will readily occur to engineers and contractors when once they understand that corrective measures must be applied.

In the built-up sections of the city it would be well if the bottoms of wet excavations were made to slope to a central point or points from which such water as gathered could be drained or pumped to a place of permanent and inoffensive disposal. For pools which it may not be practicable to empty, the use of an insecticide, such as oil or crude lime, would destroy the larvæ. Kerosene, or any light oil, will answer, provided an unbroken film is kept on the surface of the puddle. If lime is used it should be applied frequently and generously and stirred well into the water after being slacked in it. One gallon of crude carbolic acid to 500 gallons of water, is an excellent insecticide.

Bodies of water, such as swamps, streams and ponds are often difficult to handle. If they are to be eliminated they should be treated according to well-considered plans made by experienced engineers in accordance with the requirements of each particular case. Work of this kind will often partake of the nature of a public improvement, and should be looked upon as a necessary step in the development of the city. Such public improvements have been extensively made in the past. A glance at some old and new maps of Manhattan will show that a vast amount of filling, grading and draining must have been done in order to eliminate the large quantity of stagnant water which originally occurred in New York.

Here is an excellent opportunity for other departments of the city to cooperate with the Board of Health in suppressing malaria and mosquitoes. Large areas of the city are now practically valueless for want of drainage that could be made useful and capable of yielding a handsome return in taxes by suitable improvements. For example, it is doubtful if another suburb so naturally attractive, yet seemingly so hopelessly neglected, as Staten Island, exists anywhere. By providing proper drainage for this island the city could convert it into a beautiful and healthful region.

A final word remains to be said about the extermination of *Culex sollicitans*. Were it practicable and feasible of application, the proper remedy for correcting the breeding places of the salt marsh mosquito would be the reclaiming of these lands in a way which would make them suitable for agriculture, building or commercial purposes. There are two ways of reclamation suited to the marshes: First, filling, by which is meant raising the level of the ground with sand and earth; and second, dyking, by which is meant damming out the tide waters with embankments and pumping out the fresh water which collects on the inside. Both methods have been employed in or near New York, but only on a small scale; nothing large has been attempted. The economic conditions which led to the successful reclamation of 680,000 acres of English fens, of 40,000 acres of Haarlem Lake and of great tracts of sodden land in Germany, France and other parts of the world, do not seem to occur here. The experience which has been had in recovering submerged or marsh property in New York seems to indicate that only where land so reclaimed has a market value for building lots, does it pay the owners to improve it. Reclamation for the purposes of building is going on all the time; filling is the invariable process.

One practical and economical measure for reducing the number of mosquitoes *which come* from the meadows, is the destruction of the breeding places by the construction of small ditches. Suitable ditches can often be constructed for as little as 1½ cents per running foot. The ditches are designed simply to give outlet to the water which stands in the shallow pools on the meadows, and are not intended or suitable for draining the water from the saturated soil; this would be practically impossible, owing to the low level of the marshes.

One of the most beneficial steps in securing relief from marsh mosquitoes is the thinning out of foliage about houses, drives and walks. As much should be cut as considerations of sentiment and beauty will permit. If the mosquitoes are especially troublesome by day, the grass should be kept as short as possible and all foliage trimmed to a height of at least ten feet from the ground.

Before concluding, it seems desirable that a word should be said as to the extent to which mosquitoes can be exterminated. The term is not used in a literal sense. No one should think that the complete extinction of the insects is generally contemplated. It is rarely possible to destroy all the mosquitoes in a locality. This, fortunately, is not necessary with most mosquitoes, since the presence of a few is not likely to be objected to on the score of discomfort. A reduction to such a point that those which remain will not be troublesome is what is generally meant by mosquito extermination. When the mosquitoes are of the malaria-bearing type, the case is different; extermination to the utmost practicable extent should be the idea.

SOME PRACTICAL SUGGESTIONS ON MOSQUITO EXTERMINATION IN NEW JERSEY.*

BY HENRY CLAY WEEKS,
OF BAYSIDE, L. I.

THE speaker appreciates the courtesy of an invitation to come over from the States and address you on the subject that so slightly (according to your traditions) affects you as compared, for instance, with the section from whence the speaker comes. Those of that section, however, frankly acknowledge some slight cause of complaint and always have in mind, if not on their lips, the name of a neighboring commonwealth whose pests are fairly chargeable with "pernicious activity."

It is a source of great encouragement that this commonwealth of yours, whose vigorous methods have made its justice stand quite alone in reputation; the varied product of whose soil and mines, its manufactures and its commerce make it a peer among great States; whose rare, natural attractions, as well as its public spirit have drawn a very substantial part of its population from those who naturally belong outside its borders, should be the first to take legislative action against a common enemy. This, indeed, is encouraging and in line with her reputation. It remains to be seen whether this action will be followed up by other necessary action until the State becomes, as it may, freer from these evils than some others which it has combated. There is no better method to accomplish this end than discussion and education, and the introduction of the subject which your worthy body has now for the first time, as is learned, decided upon, *is* to be hoped will be a most potent factor in the educational plan.

Historical Reference.—It was long years after it was announced that by the reclamation of marsh lands for commercial purposes, as in the English fen country over a century ago, mosquitoes had been lessened, before present efforts were made to reclaim marshes simply to reduce the pests.

It is now nearly a century since it was suggested in a London publication that oil might be used to diminish mosquitoes. Probably that was not the earliest suggestion of the idea. It was followed during a half century by many confirmations, but nothing resulted of it all, until a schoolboy in Central New York, interested in natural history, experimented in destroying "wigglers" by using a little oil on the water, but it was not until that same experimenter, about ten years ago, published the results of his later work of destruction on a larger scale, that attention was generally attracted to the idea, coming as it then did from one who represented the knowledge of the government on the subject—Dr. L. O. Howard, of Washington.

The esthetic idea of getting rid of them by the improvement of unsightly situations comes with the new century.

So, in the other phase of the subject, it was a score of years after Dr. A. F. A. King suggested the theory that malaria was borne by mosquitoes,

*Read before the Twenty-eighth Annual Meeting of the New Jersey Sanitary Association, October 24 and 25, 1902.

that any systematic efforts were made to exterminate them and thus reduce malaria—the exact experimentation in the meanwhile showing in a most marvelous way the correctness of this suspicion. And the same delay in practical results followed the suspicion that yellow fever was transmitted by mosquitoes. Last year was the first in two centuries that Havana was free from a case of yellow fever, and that, after the destruction of the breeding places of *Stegomya fasciata*—definitely proven to be the source of transmission of that scourge.

The Anti-Mosquito Habit.—It all simply means, what is true in many other realms, the slow growth of great ideas and improvements. As Thomas B. Reed recently said at the centennial of Bowdoin College, "Not only must wisdom be arrived at, it must be crystallized into habits for the good of all." In this, as in all other cases, the first reformers have been the subjects of much ridicule, and it has taken a store of courage and persistence to make any impression on the public attention. It is a hopeful sign that some papers which were much inclined to be facetious are now seriously interested. An influential journal in mind now, that first alluded to the subject in a trifling way which the speaker rather boldly criticised, after a complete change during the last two years by many serious articles, gives to-day four solid pages to the treatment of this and kindred subjects in an article by your President. And so the battle has been and must be waged in all lines, equally against the learned with the unlearned. And though the cases are rapidly growing less there are still a few weaklings who think the task too great. The campaign must still be pressed until the domestic habits, the commercial habits, the sanitary habits, the engineering habits, will be as much against causing or maintaining breeding places as is sentiment against any habits that would cause any other plague. And this will only come by carefully holding all that has been gained—losing nothing by ill-considered action—and the extension of the area, gradually but surely. It is encouraging that the President of the Board of Health of the great metropolis is doing what he can in this campaign and already has put into the field a number of experts.

One of your speakers—a distinguished worker in the cause—in a letter recently expressed the fear, which has been felt all along—that many will go into schemes of extermination with only the faintest ideas of the necessities of the case, will meet inevitable defeat and thus the good cause will have a strong reaction not to be overcome in many years—all this unless the people are well informed on the subject. Any one who thinks the campaign easy work mistakes the enemy and the situation. The habits of the nation have to be completely changed and then the victory is won and hardly before.

Whereas, for instance, the acts of engineers have often been the cause of great trouble, study will avoid this cause—as in railway and highway construction by not blocking watersheds, in street improvements, by first caring for water before streets are filled in around low places, and thus through all engineering work. An instance is in mind where a railroad was so run across a lake as to form a pool without outlet. This space has been found breeding malaria-bearing *Anopheles* in vast numbers.

In a report on conditions and remedies on the north shore of Long Island, in 1901, the speaker referred to a proposed driving road in a certain section, and even described in detail how it should be constructed to obviate mosquitoes. Since then the road has been constructed and in entire disregard of the suggestion and to-day comes to hand the report for 1902 of the entomologists engaged in that territory which says: "Undoubtedly the worst natural exposure in the whole territory (about 50 square miles) was along the eastern side of the new road to the beach at Lattingtown. Somebody, in building that road, committed an error that is no less than criminal, for the pools formed there, on account of the natural drainage being cut off by the road, bred not only *Culex* but *Anopheles* in almost as great numbers per square foot as was physically possible."

Instances will occur to all of the extension of city streets so as to enclose water in which situation it becomes most excellent breeding grounds. New York City has acres thus conditioned in the Bronx, in Long Island City and elsewhere, with the necessary consequences of discomfort and ill-health. Landscape architects, public officials, farmers, gentlemen owning country seats, physicians—in fact, every one must cultivate the anti-mosquito habit. Educated to believe in their danger and the possibility of their extermination, all must talk of it as well as practise their belief, whether in public or private spheres. The decided change from incredulity or even opposition to strong belief, which will result from this course, was most clearly noted in a certain section where theory and practice have combined in the light of a successful experiment on Long Island, before referred to. And so the work will grow, for nothing exterminates like extermination.

The advance of science has noted some remarkable changes of views—none more so than in regard to the causes of malaria and yellow fever, and this advance, when understood, has greatly strengthened the anti-mosquito habit. The plain practicability of the means used in doing this work appeals to all who are informed. It impressed the speaker many years ago, and enforced rest has afforded an opportunity later of renewing the thought and writing on the subject. And every one who accepts the now indisputable proofs of danger from the pests is called to a like mission of extermination.

Importance of the Work.—The question of exterminating mosquitoes from a section also implies so many other results than simple riddance, that it is not thought to be overstating the case to say that it is one of the most far-reaching economic questions of the day. Foremost comes the increased healthiness of the section—its relief from

the most insidious disease, malaria, or from that dreaded scourge, yellow fever. The physical and mental dejection of a malaria-ridden people or the devastation that comes of an invasion of yellow fever is beyond description. It has been too clearly shown that these ills may be avoided by exterminating the mosquito that instances will not be cited before this well-informed body.

Another result comes in the improved conditions resulting from the breadwinners of a malarial section being able to employ all their time at work—instead of suffering the loss of a large proportion of the year by actual illness and the loss of vigorous life. The loss, actual and incidental, to some communities from malaria in one year would accomplish all the relief work that would banish it forever from their midst.

Again we have the physical improvement of the land reclaimed through exterminating operations, and this now worse than useless land throughout the country amounts to an almost incredible area. Shaler estimates the salt area of the United States to be over 12,000,000 acres, and the lacustrine swamps, not including boggy lands, to be about 25,000,000 acres. To turn this vast area from pestiferous conditions to productive conditions means the addition of many billions of wealth to the country. The resultant effect on neighboring values adds another equally large element of importance to extermination by reclamation.

And what has been more recently acknowledged as an important consideration, namely, public comfort, also applies with great force in this movement. Though some varieties of the enemy may not actually cause disease, the discomfort they all cause is beyond estimate. And then comes what is important in its way—the esthetic results—the improvement of foul breeding places, often right within the line of residence areas. Population and values increase with attractive and healthy surroundings and in every aspect imaginable there is a general betterment. It is doubted whether more than two other economic reforms of the country can show an array of material and other advantages equal to this.

If one is a benefactor who makes two blades of grass grow where before but one grew—another is equally so who causes no mosquitoes where formerly millions grew. And anyone who does this needs no greater monument than the gratitude of a once-suffering but relieved people. It is to be hoped that your excellent society may earn such a monument through its present action in opening this discussion.

The speaker some months ago gave, in the *Scientific American*, a statement of some of his conclusions concerning the mosquito plague which he now ventures to repeat as giving briefly his earnest views:

1. Every mosquito found in a district is an indictment against the public spirit, the progressiveness, the intelligence, or the persistence of the people of the district, except in instances so rare as not to affect the statement.

2. Every case of malaria, not a relapse or an importation into a district, is evidence of avoidable crime against humanity in some or all of its interests, and against the fair fame of some of the most beautiful sections of the land.

3. That in greater degree than smallpox is malaria a crime for the latter reaches more persons and its effects are more persuasive. Some high authorities are urging the imprisonment of smallpox patients as criminals.

And when these ideas are fully realized and acted upon your State will begin a new era of development. On the other hand it is the sincere belief of the speaker that if this State allows other sections to get in advance of her along the fighting line, her population and standing as a place of residence will be seriously affected.

There is a movement—largely educational so far, it is true, but still having a successful practical side—going on along the hilly north shore of Long Island which is attracting great attention and bids fair, if continued along suggested lines to lead to a great increase in population and the movement of this new population must affect other sections adjacent to the metropolis. Probably no point will be affected more than near sections of your State. The future of Long Island has so impressed the greatest railroad management of the world, that it is spending many millions of money in making it convenient by tunnels, etc., for New Yorkers to make that island their home. And it will not be but a short time before New Yorkers doing business in the metropolis and living in your State, will be able to drop themselves and their household goods down into a tunnel on the Jersey side and have all shot through to Long Island most conveniently. And this will most surely be the result unless you can say, as Long Island hopes to say before long, "No mosquitoes; no malaria." A recent convert—a man of large affairs—lately said that he believed both of these troubles would be extinct on Long Island in ten years—to which the speaker responded, "It can be so." If your State presses the battle she will hold her own, but not otherwise.

Chances of Final Success in New Jersey.—The question naturally arises, Can the mosquito be exterminated from a whole State? The confident answer is "yes," if the fight is well-planned and pressed. The simple extension of the successful work carried on over a limited area will accomplish precisely the same results. The State is densely enough populated to demand that all breeding places be obliterated and that means success for the whole State.

It also requires, as before stated, an education of the public and a willingness to spend a large amount of money—no, not large when results are measured, indeed, an amount only that would be returned to the State within three years of the proclamation of liberty. Firm but fair legislation must be planned to aid in the movement or it will be seriously retarded by those who are incredulous, careless or contrary.

Long-held theories of night air, of miasma, of air from fresh excavations and all that long list are being fast exploded—though such creations are generally long-lived. This rapid change of view as to the true cause of malaria will greatly help you. And though your legislators will be facetious, as at the last session, nevertheless they will grant the necessary funds if the cause is rightly put and the money appropriated shows results. Your arguments to reclaim all the breeding places is greatly strengthened by the fact that no part of your State is beyond easy access to large centers of population, so that every acre reclaimed could be profitably utilized for residential or agricultural purposes.

For many years the speaker has regularly read what has so strongly been set forth by your most efficient State geologists and their coadjutors on the subject of drainage and reclamation. The theme has been more interesting than any romance and why all the successive yearly presentations have not had more effect is a cause of great wonder. Of course many of the reports were made before the compelling argument of healthfulness had attained, as now, its strongest force. The State now must listen to those who officially present this matter. Its wastes, salt and fresh, must be redeemed, not only because to do so is profitable and attractive, but preeminently because the greatest boom to a community—good health—demands it. For forty years your State geologists have urged action toward reclamation and the visits abroad of Professors Cook and Smock, resulted in arguments that should have produced great benefits to the State. After Professor Cook's visit to Europe he closes his report on this subject thirty-two years ago, thus: "Mosquitoes and green-headed flies, those pests of our salt marshes, would certainly find a less favorable breeding ground if the water was all drained from the surface and this of itself would be a great saving to the community. I saw a few gnats (English for mosquitoes. W.) in the English fens, none in Holland. . . . Such lands are by far the most profitable and productive of any I have seen abroad."

And yet, looking at New Jersey's problems as compared with those of the countries visited by him—England and Holland—the task is a simple one to redeem its wastes and exterminate its mosquitoes. For instance, you have no situation where it will ever be required to reclaim and cultivate valuable land twenty feet below sea level as in some cases in Holland.

In 1892, before the cause of malaria was known, Professor Smock said: "Looking to the ultimate development of all our natural resources, and the removal of the unsightly and malaria-breeding wastes . . . the need of some carefully planned and judiciously executed drainage projects on our tidal meadow lands is of great importance and is much to be desired.

The Fresh Water Swamp Problem.—By its geological formation New Jersey offers a somewhat difficult problem in the reclamation of some of its interior swamps, and these must be reclaimed to solve the mosquito question. For instance, with quite parallel ranges of mountains in the northern part, there have been formed water surfaces between and beyond them with scarcely enough opportunity of outlet to relieve the situation. And this difficulty has in some cases been increased by the works of man. It will readily be conceded that the water of the Passaic basin forms the greatest menace as fresh breeding areas in the State. Several swamps of thousands of acres here occur and if not already they will slowly, as is usual, but surely become the habitat of *Anopheles* until in their entire vicinities malaria will become endemic.

That "Lake Passaic" existed at one epoch with an area 30 by 10 miles, stretching from east to west from Morristown to the second Watchung mountain, and from south of Millington about to the New York line, seems most certain. At any rate this area now presents a problem in the midst of valuable residence property, as left in this condition at a later epoch—with its difficult outlet and its scattered water surfaces.

The efforts at relief here have been long continued and as yet are only partly successful. The statement is thought to be correct that if even all works planned are carried out relief would not be had for many extensive marshes of the Passaic and its tributaries. A third of a century ago some of these marshes were surveyed and reported upon and yet they still exist. By reason of the long, but slightly descending course of some sections of its bed, large areas are flooded constantly and still more are flooded by freshets so as to render them useless for cultivation and worse than useless as forming breeding ground.

Though there is an elevation of 230 feet above tide at Great Swamp, there is a descent of only about one foot a mile in the Passaic and its tributaries for about 20 miles—in a large part of that distance it being substantially level. In fact from its source to Little Falls the descent is only a fraction over one foot to a mile. To overcome this would seem to be well-nigh impossible, and yet thus to reason is not in the spirit of the age. Some thoughts in this connection must be reserved for fuller consideration and study of data, but so far as considered it is thought that this whole section could be relieved by State action and these vast interior swampy breeding grounds be eliminated and conditions of better health and living prevail, waste lands made cultivatable and even habitable, and a great economic and financial benefits to the State result.

You have a fresh swamp area of vast extent—just what, your geologist could not say—little of which has been redeemed for cultivation. Take, as an example, the Great Swamp with its 5,500 acres of black muck about 5 feet deep, it offers an investment for capital almost beyond the dreams of avarice of any farmer.

In New York State, there was some twenty years ago a situation that will illuminate our dream. A swamp near a village was claimed to

be the source of an epidemic of malaria—why, was not then known. At some distance was an abandoned canal, deep enough to drain the swamp. This idea was urged, the State did the work, the swamp was effectively drained and malaria shortly disappeared. The swamp was cleared of growths, put under a state of cultivation for vegetables, particularly onions and celery. It was stated many years ago that this worse than useless land was then paying 10 per cent. net on a valuation of $1,000 per acre. The speaker purposely made inquiries a few days ago as to present income and found that that statement of returns still held true and that $50 an acre only had been the cost of redemption. The tract is now cultivated by several farmers who are making farming pay. Your State has thousands of acres of equal opportunity and but limited cultivation is as yet practised. These lands must be secured against inundation and this must be the work of the State under plans, a discussion of which time-limit excludes. A low estimate of increase in the valuation of these lands would be $100 per acre. Net results of 10 per cent., as has been quoted, would warrant the statement of increase to be $1,000 per acre, but at $100 the State would have an increase of valuation of many millions of dollars.

But these material considerations, as vast as they are, are not urged as, by any means, the greatest result to be accomplished. When it is realized that these great wastes are the congenial habitat of mosquitoes, quite generally of the malaria-breeding *Anopheles,* and when it is realized that the direct and indirect misery and loss caused by this disease are beyond a financial showing, then does the transcendent importance of action become manifest.

The Salt Marsh Problem.—As in the case of the interior swamp problem, we take up a single instance of coast marsh, that which is more familiar to most of us, namely, the Newark and Hackensack meadows. The treatment of one section, however, is not the proper thing for all, for in few realms will the skill of the engineer be more required than in meeting the differing conditions. No part of the salt marsh problem is more intricate than the withstanding of tides. Studied for centuries in Europe, made a government work, untold millions of money expended, there has resulted a fund of information and skill not realized here.

Your geologists estimate that the State has about 300,000 acres of tidal marshes, or one-eighth of its farm land, and further, that considering the extra fertility of these marshes, if reclaimed, that there would be an addition of 20 per cent. or more to your farm products. Of course, subsidence of some of these reclaimed lands has rendered automatic drainage inoperative, but it would seem that in your cases of reclamations, two centuries old, profitable resort could be had to pumping. Some efforts at reclaiming a section of the Newark meadows began about 40 years ago, but were not crowned with final success. Some plans which have been proposed by your Geological Survey for relief of this entire section are most interesting and brilliant. But the conditions to the speaker's mind, demand more authority and means and a still more radical treatment than can be commanded by any private movement. The lack of success noted above and the efforts to induce further reclamation, so far unsuccessful, point to the need of further consideration by the best authorities in the lines involved —engineering, legislation, financiering and what not, and a concentration of effort on what may be decided upon.

The speaker has long had in mind some relief plans which he has not had the opportunity or time to confirm by data, which has not been suggested so far as he has noted. Some such plans would seem to solve the difficulty. Surely advanced thought must find some way of overcoming the great menace to values, to health, to appearances, to all conditions which prevail in this great waste area of 27,000 acres. When it is shown to be advisable, and there is expended $25,000,000 in improving the Nile, when Chicago builds a canal forty miles long, costing $33,000,000, to improve conditions, when the great Pontine marshes are to be reclaimed at vast cost by the Government of Italy; when individual enterprise spends millions in engineering projects, surely a State of the resources of New Jersey ought to carry out—and that speedily—some means of relief for the great problem that is presented in these marshes within the constant view of so large a part of the metropolitan area.

But I may not encroach upon the subject of the speaker who is to follow.

A few days ago the writer stood with the correspondent of the *Brooklyn Eagle* and the *New York Times,* which papers have taken a great interest in this subject, at the edge of what was, two years previously, an impassable salt marsh infested with mosquitoes and presenting an unsightly waste in close proximity to one of the finest estates on Long Island, or even in the country. That day were seen growing as fine celery as one could wish, turnips measuring sixteen to eighteen inches in circumference, a fine field of rye, another of timothy, besides other crops; and in some other parts were seen the great breaker plough, drawn by specially shod horses, turning over in perfect furrows some more of the rich land which as yet had not been mechanically or chemically subdued. This has come about, as it may with your hundreds of thousands of acres of salt marsh, by a firm conviction and the pressure of that conviction against the opposition of nature, of ancient sentiment, and all else. In the case referred to, the owner himself experimented under many discouraging circumstances, had much of his work to do over and over again, laid out a large amount of capital, but under later hands is working out his cherished ideas, and is gaining one of the finest features of his vast enterprise. That day but a single mosquito was found in traversing the entire marsh.

In conclusion, and briefly, Organize! Let every community where mosquitoes and malaria prevail, organize. Much can be attained in this way that is not possible by individual action. The movement on the North Shore of Long Island to which reference was heretofore made, is the result of organization; not organization specifically for mosquito extermination in that case, but that as coming under the beneficent objects of an association of men the peers of any in the land in any respect; men who thought the mosquito problem not too great, nor yet too small for them to attack. Locate all the causes of your troubles—the nesting places of mosquitoes and malaria; let competent experts be kept in the field all summer; determine whether the places located are breeding *Anopheles;* ask all your physicians to report the sections where malaria prevails; note, as did the above-mentioned movement, the exact concurrence of the two evils; candidly inform the people, irrespective of any fear of injuring a section, the fact and the cause of the fact; urge legislation if existing laws do not meet the case; ask State help where the proposition is too large for towns; let eminent domain have full play; appoint committees, organize meetings and lecture courses; lead public sentiment, raise funds. No festering sore is cured by throwing a mantle over it; expose it to the bone, if necessary, and clean it out. Let considerations of humanity, the bettering of the conditions of all classes, especially the poor, who are most affected by these evils; let these bravely prevail. Having located the enemy, attack him with the vigor you would attack any other scourge. Plan methods of relief carefully and carry them out thoroughly. To be less than thorough means defeat and a setback for the principles of the warfare. Whether the action refers to the spraying with oil of a pool a foot square or the drainage of the wet lands of an entire State, let it be done, as it may be done, thoroughly, and victory is as sure as any martial victory ever was. The instances are now too numerous for anyone to question this, and the call is to every one in the State, Enlist! Enlist!!

THE SANITARY ASPECT OF THE MOSQUITO QUESTION.*

BY JOHN B. SMITH, SC.D.,
OF NEW BRUNSWICK, N. J.;
PROFESSOR OF ENTOMOLOGY, RUTGERS COLLEGE.

NO ONE factor has had a greater influence upon sanitary practice in general, than the discovery that certain insects act as intermediate agents in the transmission of specific diseases of animals and human beings. That flies of several species are active agents in transferring germs of typhoid and other intestinal diseases from contaminated excreta to food substances was proved to demonstration in our camps during the Spanish-American war. This forms one type of disease transmission where the insect serves as a carrier only and the species is, comparatively, immaterial.

Quite a different state of affairs exists when disease is caused by a specific organism that has an intermediate host in which one of its stages is passed. Such a parasite is strictly limited in its cycle and cannot move beyond the path marked out for it: the privilege of infesting two hosts, is paid for by restrictions which may not be transgressed. A number of insects have been found as intermediate hosts for diseases of animals; but for the present only the mosquitoes will be considered.

Positively proved against these insects are yellow fever, filariasis, elephantiasis and certain malarial fevers, all of which depend for their existence upon the presence of certain parasites in the blood or lymph of the individual affected.

For yellow fever the agency of the insect has been proved experimentally only. The parasite causing the disease is not yet known and none of its stages has been actually demonstrated in the mosquito. All that has been written on this point is inference based on observation and is reasoned from what we know of other diseases, chiefly malaria, the parasites of which are known in nearly all their stages. Concerning yellow fever I need say only that one species of mosquito alone, *Stegomyia fasciata,* has been found able to carry it. We do not have this species in New Jersey, so far as my observations extend, but we have an allied form which has been referred to the same genus.

Recognizing the actual method in which yellow fever is carried has completely changed medical and sanitary practice for its control. No longer do we fumigate mail matter, destroy fomites and bar out products of countries where the fever exists. If we fumigate ships, we do it to kill any mosquitoes that it may harbor, and if a patient is at hand, the one guard that is deemed essential is that he should be absolutely protected from mosquitoes. So long as a case is kept so screened that these insects cannot reach it, so long it cannot be a center of infection.

The duty of the health officer in a locality where this disease is endemic is to control the mosquitoes carrying it by destroying their breeding places, and the effect of scientific sanitation has been beautifully illustrated in the results obtained by our Army medical service in the West Indies.

Malarial fevers whether tertian, quartian or estivo-autumnal, are carried by mosquitoes belonging to the genus *Anopheles.* In general literature all the species of the genus have been placed on one level; but as a matter of fact the charge has been proved against one of our species only—the *Anopheles maculipennis* of European writers. Against this species it has been proved to demonstration in

* This paper was read as an introduction to a series of 50 slides which illustrated all the stages of the mosquitoes referred to and the malarial *Plasmodia* in all forms. Typical breeding places were shown from photographs, as was a ditching machine which had been in use on Massachusetts marshes.

America as well as in Europe. The common species in New Jersey is *Anopheles punctipennis* and I attempted to test the ability of this species to transmit the disease during the current season. Unfortunately cases were scarce and while the mosquito supply was abundant, only two patients were secured. One near Newark, one at New Brunswick. In both instances the results were negative; but the conditions were not such as to make this negative evidence positive. It is a suggestive fact, however, that while *Anopheles punctipennis* is common throughout South Jersey and especially in the pines, malaria is not at all a prevalent disease there; but where I have found *Anopheles maculipennis* at all common, malarial fevers have been more or less abundant.

It might seem that, with cases of malaria occurring in some numbers in a locality, and *Anopheles* even moderately common, malarial fevers should be much more prevalent than they actually are. They are prevalent enough, in all conscience and that they are not more so is due to the conditions imposed upon the spread of the *Plasmodium* causing the disease.

The *Plasmodium malariæ* is an animal; a protozoan, small enough to live and develop in a red blood corpuscle and its life period may be two, three or four days under proper conditions for its development. When fully grown and ripe it bursts, and liberates into the general circulation a great mass of spores, each of which enters a red blood corpuscle as soon as possible. In an ordinary case, due to one inoculation, the sporulation is simultaneous for all the parasites and causes the chill. The recurrence of the chill, means, therefore an increase in the number of the parasites and an increased number of blood corpuscles attacked. If a mosquito bites a patient of this kind many of the *Plasmodia* and their spores may be taken up; but even if the example were the proper species of *Anopheles* this would not cause infection, because in this condition the *Plasmodium* can develop in human blood alone. In the course of time, however, there are produced bodies resembling the ordinary spores; but which do not attempt to enter blood corpuscles. On the contrary they float about until devoured by the leucocytes or until withdrawn from the human body. If so withdrawn these bodies develop further and some produce flagella or threads which break off and unite with the other, larger, round bodies. These are the sexual forms of the *Plasmodium* and the flagellate bodies are the males. Thus far the development may take place anywhere outside the human body and in any kind of mosquito; but if the organisms be taken from the blood by the proper *Anopheles* the development goes further. The fertilized macrogamete works its way into the stomach wall of the insect, develops there and, in about a week is mature, discharging into the body cavity of the insect thousands of "blasts" which tend to work their way into the salivary glands of the host. If now, the mosquito again bites, it introduces with the saliva a number of these blasts which at once work into blood corpuscles, establishing the disease in a susceptible individual.

There is required, therefore, for the transmission of malaria from one person to another, the following: A patient suffering from the disease, in whose peripheral circulation are the sexed organisms or gametocytes; the proper species of *Anopheles* at just the right time to draw these organisms into its digestive system: undisturbed development at a temperature not much below 80° for at least a week: an uninfested individual who is not immune and who is bitten by the diseased mosquito. All these conditions must be satisfied before infection can take place, and the problem for the sanitarian is how to interfere with this life cycle in such a way as to prevent its completion altogether or in large part.

The species of *Anopheles* winter as adults, only the female surviving. Impregnation takes place in the fall, and as early as October 6 some fertilized females begin to seek shelter, though larvæ are found through November even in pools that have been ice covered. The important point is that these mosquitoes do not feed before they become dormant and are therefore incapable of carrying over the *Plasmodium* in any stage. The organism lies dormant in the blood of malarial patients ready to begin development when conditions favor. As to places of hibernation, *Anopheles* selects houses or barns and preferably cellars. From a single uninhabited house near Bordentown several hundred examples were taken and from the cellar of another, occupied house, nearly one hundred were secured. In the cellar of my own house at New Brunswick a number were taken last winter and in the storerooms of the Experiment Station buildings examples may be found all winter. Dormancy is a matter of temperature: in freezing weather the mosquitoes may be readily taken off the walls with the fingers and will make no attempt to move. At 60° they will fly readily and in a house kept at a temperature above 75° they will become active and may bite. Winter development of malaria is by no means unknown and means only that in a warmed house one or more active specimens of *Anopheles* obtained a chance to bite first an individual containing the *Plasmodium* in the proper stage and afterward one that was previously uninfected.

Winter fumigation of cellars in malarial districts is therefore a sanitary precaution of the highest value since it will destroy the hibernating mosquitoes that would start the breeding next spring. Equally necessary is the very thorough treatment of all persons afflicted by malarial fevers, for if we lessen or destroy the sources from which mosquitoes may be in-

fected, the mere presence of the insect can cause no injury. It makes no difference how many *Anopheles* we may have in a given locality; unless there is a chance to get malarial blood they cannot of themselves produce malarial disease.

We might, therefore, from the strictly sanitary standpoint ignore the mosquito altogether and, by protecting all patients from bites at night until thoroughly cured, could render the insect altogether harmless.

When warm weather becomes fairly established in May, the *Anopheles* awakens from its winter nap and flies about. Its first instinct is to eat, and this it does, feeding mainly on plant juices, though it does not disdain a meal of blood if it is easily obtainable.

Out of the thousands that go into hibernation only hundreds emerge in spring. They lay their eggs in quiet pools containing grass or other vegetation, but development is slow and the death rate high. It is difficult to find *Anopheles* larvæ until midsummer and adults are rarely seen, even in localities where larvæ are found. Late in July and early August increase becomes marked and *Anopheles* larvæ appear everywhere. They are just as apt to occur in a temporary pool in an open lot as they are along the quiet grassy edges of a pond or meadow brook. I find them in the water pails in my garden and in the brackish pools of the Newark meadows. I have never found them in really foul water and rarely in woodland streams; but aside from that, there is scarcely a bit of sheltered water in which they will not occur. On the salt meadows about Newark, Elizabeth and Jersey City thousands of *Anopheles maculipennis* breed in late August and early September, and I have no doubt that many of these find their way well into the cities. That the *Anopheles* will fly half a mile from its breeding place over a level country I have proved to my own satisfaction. I am not so sure that its flight is limited by that distance.

On this point I speak advisedly, because for six full weeks I have had an experienced collector exploring the marshes from the Passaic to the Rahway River. I have spent days on the marshes along the South Jersey Coast and collections made from hundreds of pools have been sifted in the laboratory.

To learn the condition of affairs in my own city, I had my assistant explore systematically every square laid down on the New Brunswick map and some fifty odd places were plotted where *Culex* and *Anopheles* larvæ were found. All of these breeding places in one ward were treated twice by the Board of Health with chloronaphtholeum and each time the larvæ were killed off; but by cooperation with the Street Commissioner more than half these breeding places can be permanently cured at little expense and most of the balance can be reached by compelling proper drainage, repair of gutters and other channels for carrying water.

Here is the field for local sanitary authorities. There is no reason why mosquito breeding pools should be allowed within any city, town or village limit, and any pool may breed *Anopheles* in late summer. Good sanitation demands the removal of such plague spots and the abolishment of the mosquito pest. If all the local authorities throughout the State acted toward the same end, even a single year would show marked results.

The life cycle of *Anopheles* is known for the entire year and for every stage: the places preferred for breeding are known: the methods of destroying such breeding places are known: it remains for us to apply our knowledge and on this point it should be said that the application of our knowledge should be intelligently made. Oiling a pond containing fish or other aquatic life is an absurdity that does more harm than good and creates an offense as bad as that sought to be abated. Trimming the edges so as to permit the small fish to get everywhere will keep the pond clean and will be a permanent improvement.

In company with Dr. W. N. Berkeley, of New York city, and Mr. W. P. Seal, of Delair, N. J., I looked over some of the bodies of water in Central Park, New York city. Not a mosquito larva was found in the larger lakes and ponds; but in the woodland pools with shallow overgrown border *Anopheles* and *Culex* were found in any numbers. No mosquito larva lives in any ripple area in any body of water and very few indeed escape their natural enemies in permanent bodies of water not too much choked with vegetation.

I have indicated in an earlier paragraph, that adult *Anopheles* travel for some distance and also that the salt marsh areas in our State are dangerous, in some places at least. Here is a point where local action is not sufficient; but just how this matter should be attacked has not yet been worked out, and is still under investigation.

Little time remains for mention of those other mosquitoes that make life a burden, if they do not actually cause or carry specific disease. The species that dominates the entire Pine section of South Jersey comes from the salt marshes miles away, and local methods are useless. There are not enough mosquitoes bred in the fresh-water swamps in this region to cause serious annoyance; but the incoming visitors make up all deficiencies in the local supply. Even the salt-marsh must not be too generally condemned. More than three-quarters of the entire salt marsh area of the State is absolutely safe from the mosquito breeding point of view and the problem will, I firmly believe, narrow itself down until it reaches a very simple and not unreasonably expensive conclusion.

I have studied this species during the past season from every point of view; have bred it from the egg, have gathered eggs on the marshes and

kept them dry for weeks; indeed, I have now larvæ hatched a few days ago from eggs gathered in mid-July, and I believe I know the habits and breeding places, at least as well as any one. Speaking from this knowledge, I believe that the day is not far distant when the shore mosquito will be only an exceptional occurrence; but that day has not yet arrived.

THE SYMPTOMATOLOGY OF TABES: AN ANALYSIS OF 140 CASES OF LOCOMOTOR ATAXIA.*

BY JOSEPH COLLINS, M.D.,

OF NEW YORK;

PROFESSOR OF NERVOUS AND MENTAL DISEASES IN THE POST-GRADUATE MEDICAL SCHOOL; VISITING PHYSICIAN TO THE CITY HOSPITAL; CONSULTING NEUROLOGIST TO THE HOSPITAL FOR RUPTURED AND CRIPPLED, ETC.

PART II: SYMPTOMATOLOGY OF TABES.

Subjective Symptoms.—The subjective symptoms of tabes are variable; the objective symptoms are constant. The former consist of pain usually in the lower extremities variously described as shooting, lancinating, lightning-like, spot-pains of varying severity and duration, often accompanied with involuntary contraction or drawing up of the part in which the pain is manifest; of paresthesia of the extremities and trunk described as numbness, formication, "pins and needles," sensation as if the part were encased in something soft and thick, as if the skin was too tightly drawn around the part, or as if a limb or a portion of it was being compressed; of uncertainty in standing and walking, particularly in public and unaccustomed places in which vehicles and people are passing, on going down stairs and on attempting to move about in the dark or to stand with closed eyes; of leg weariness and of giving way of the knees; of the necessity of watching the feet when walking, of tendency to fall when hurrying, of disturbance of the function of the bladder, particularly of diminished expulsive force, and of incontinence, diurnal or nocturnal or both; of lessened copulative capacity and of diminished inclination for sexual indulgence; of diplopia, usually transient and recurrent, occasionally associated with paralysis of some of the eye muscles apparent to the patient himself; of attacks of agonizing pain and disturbed function in some viscus or portion of the body, such as the stomach, the bladder, the rectum, the larynx, penis, clitoris, etc., called visceral crises; of vasomotor and trophic manifestation which will be enumerated below, and of the general accompaniments of impaired tone, lowered vitality, loss of weight.

Objective Symptoms.—These, named in order of their constancy and diagnostic importance, are loss of the pupillary light-reflex in conjunction with preservation of the contractility of the pupil in accommodation (Argyll-Robertson sign); loss of the tendon jerks, such as the knee and ankle-jerk (Westphal sign); inability to stand steadily with the feet in apposition and the eyes closed (Romberg sign); ataxia of the extremities, principally of the locomotive apparatus, but also of the upper and cephalic extremities; disturbance of sensibility, slowness of recognition of tactile stimuli, hypesthesia, anesthesia, all "segmental," *i.e.*, corresponding in their display to the distribution of the sensory nerves of the spinal segments; analgesia of similar distribution; hypotonia; disturbance of the deep sensibility; loss of sensitiveness on pressure of the ulnar nerve in the olecranon fossa (Biernacki's sign); of painless ocular palsies, most frequently of the third nerve; of optic atrophy having the characteristics of primary decay; of trophic disturbances of which the commonest are painless enlargements of joints (tabic arthropathies), ulcers having a punched out appearance; perforating ulcers; atrophy of muscles giving rise to deformity such as the "tabic foot," fragilitatis ossium and tachycardia.

The object of this study is a detailed consideration of these subjective and objective symptoms. Before doing so some attention must be given to the types of tabes.

Types of Tabes.—One does not encounter and examine many cases of tabes before it is impressed upon him that scarcely two cases are alike, either in the manner in which the symptoms unfold themselves, or in their constancy or association. This experience is puzzling to the beginner. Because of this it may be well to emphasize the fact that the disease usually conforms in its clinical delineation to one of several types: (1) The type in which pain of great severity overshadows other symptoms, the neuralgic type; (2) the type in which disturbance of the sympathetic nervous system predominates; vesical symptoms, crises, arthropathies, etc.; (3) the type in which motor symptoms predominate, profound ataxia, the patient becomes very ataxic, perhaps even bedridden a few weeks or months after onset (the antithesis of the benign type); (4) the type in which optic atrophy develops early; (5) the type in which the symptoms are particularly of the cephalic and upper extremities—cervical or high tabes; (6) the type in which the disease comes on very slowly; (7) the type that comes on precipitately. I am not quite sure whether a clinical division should be made to include cases with (8) cerebral symptoms, not paresis, but I am inclined to think there should be. This is an artificial distinction of course, but it facilitates recognition of the disease by the general practitioner, and especially correct interpretation of those cases that do not conform closely to the typical case depicted in the text-book. Moreover, the prognosis of tabes varies with the clinical form of the disease. The outlook for the patient can be forecast with much greater accuracy if this fact is recognized and kept in mind.

I shall depict briefly the manner of development and clinical features of a few cases to il-

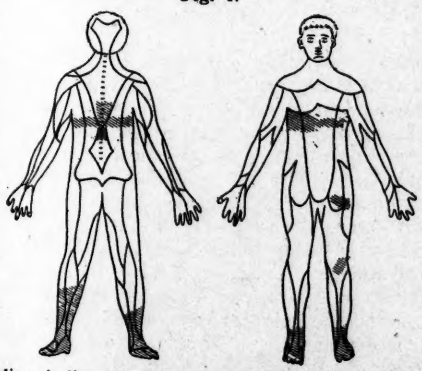
*Part I of this series appeared in the MEDICAL NEWS of January 3.

lustrate what may be called a typical case of tabes and cases that conform to above division.

Case I.—Typical, Unselected Case of Tabes.—Male, forty-eight years old, contracted syphilis when thirty-six years old; infection moderately severe; under treatment for two months at the time of the initial lesion and about an equal length of time when sores developed on the legs the following year. Initial symptom of present disease when forty years old, *i.e.*, four years after infection, consisting of easily induced fatigue of the legs, weakness and sense of uncertainty on standing and walking. Later he complained of headache, and for a number of weeks at this time diplopia was very distressing. This disappeared and has not troubled him again until lately. The next symptom to develop was pain in the back, a dull ache, radiating to the epigastrium. Later (five years ago) shooting pain in the legs first developed. Pain of this kind came on about once a week, lasted a few hours, and then disappeared. He thinks the attacks were more frequent and of greater severity when the weather was inclement. Four years ago, immediately after an operation for hemorrhoids, he first suffered from retention of urine; after that he frequently experienced difficulty in starting the stream. Since then he has been troubled more or less all the time from incontinence of urine. Occasionally the rectal sphincter is incontinent. He complains of burning sensation through both heels, paresthesia of the legs, especially below the knees; of uncertainty of gait, especially when walking in a crowded thoroughfare or in unfamiliar places; of giving way of the knees, of turning in of the ankles, of tendency to fall when he attempts to hurry, of difficulty in descending stairs, of lightning-like pain in the legs, and of impotency.

Examination shows ataxia of gait which is very profound when he attempts to walk with the eyes closed, or backward; ataxia of station very much increased by closing the eyes, and ataxia of the upper extremities manifest on attempting to perform delicately coordinated movements. All the tendon jerks are unelicitable; the skin reflexes are present but slow; the plantar jerk is of the normal flexor type. There is profound hypotonus. The straightened lower extremities can be brought to an angle of 250 degrees with the body. The pupils are equal, pin-point in size, and do not react to light; they do react slowly, however, in accommodation. Ophthalmoscopic examination negative. Tactile sensibility is diminished over a narrow area on the anterior surface of the chest, a corresponding area on the posterior surface and along the spine and in the legs, especially over the posterior surfaces. The sensory disturbances are indicated by the accompanying chart. The pulse is 90; the heart of normal size, and presents no abnormalities save accentuation of the second sound. Mentally, the patient and the family have noted no change.

Fig. 1.



Shading indicates areas in which there was blunting of tactile sensibility in a typical case of tabes.

Case II.—Neuralgic Type.—Mr. X., forty-three years old; occupation, county clerk. Denies syphilis, but has had several attacks of gonorrhea; has lived freely. When thirty-eight years old he began to have attacks of pain principally in the back and in the legs, in the former location it was described as boring, in the latter shooting. For the relief of this pain he went to Hot Springs, Ark., and took antisyphilitic treatment, and for a few months following this trip the pains were less severe. The next year the pains returned, this time in the arms as well as in the legs. He has had no trouble in locomotion except when fatigued, a condition that is easily induced. He complains of girdle sensation, of occasional diplopia, and of enfeebled memory; but the one symptom that overshadows all the others is pain. It is paroxysmal, of intolerable severity, of increasing frequency, made worse by mental and physical fatigue, and somewhat alleviated by lying down. Sometimes it is so severe that he has to have morphine administered hypodermatically. He has had at times attacks of pain in the stomach, followed by nausea and vomiting, which continue for several hours, accompanied by great prostration; typical attacks of gastric crises. For the past year or two he has had now and then difficulty in urinating, and sometimes incontinence at night. His sexual vitality has gradually decreased. There is no complaint of locomotion, of unsteadiness of any kind or of incoördination. Examination shows loss of knee-jerks and ankle-jerks; plantar, cremaster and abdominal reflexes preserved; Argyll-Robertson pupils; swaying when the eyes are closed and the feet together; disturbance of sensibility, consisting of analgesia and hypesthesia of the lower extremities. There is no hypotonia. Ophthalmoscopic examination shows normal optic nerves.

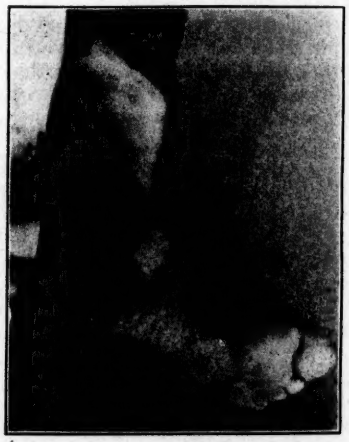
Caase III.—To Illustrate the Type in Which Disturbance of the Sympathetic Nervous System Predominates; Vesical Incompetency.—Man, single, forty-four years old, mechanic. In December, 1885, he contracted syphilis. The infection was followed by mild secondary

manifestations. He was under constant treatment for two years. The first symptom of his present trouble developed in December, 1892, *i.e.*, seven years after the specific infection, and consisted of constant desire to urinate. It came on suddenly while in a theater. This continued for three or four months, and during this period the ardor was so great that he would have to relieve himself every half hour or more. For this trouble he was treated with electric sounds. During one of these treatments a false passage was made which took several weeks to heal. Later he began to get attacks in which the bladder would not empty itself at all and he would have to resort to various devices, one of which was to work the arms up and down vigorously over the head in an extended position with or without listening to running water at the same time. Occasionally straining when sitting down would succeed, but frequently it was necessary to use a catheter. He was first seen by me in January, 1898. There were no shooting pains, no girdle sensation, no diplopia, no ataxia, no mental symptoms, and there are none now, five years later. The bladder symptoms continue. Examination showed slight Romberg symptom, the knee-jerks and ankle-jerks cannot be elicited, the cutaneous reflexes are normal, the pupils are typical Argyll-Robertson, pressure upon the ulnar nerves does not cause pain, and there is distinct hypotonia. He is distinctly analgesic over the ulnar areas, but there is very little sensory disturbance in the lower extremities. He stands on his feet nine hours a day, works hard, and still the disease does not seem to have made the slightest progress in the five years that he has been under my observation. To-day it would be impossible to make the diagnosis without an examination to reveal the physical signs. In fact, there is nothing about his condition that suggests tabes.

Case IV.—Tabes, Ushered In With Gastric Crises.—A man, thirty-one years old, contracted syphilis when twenty-two years of age, and received vigorous and thorough treatment with mercury and iodide of potassium. When twenty-nine years old he was attacked suddenly, while in Chicago, with pain and sense of oppression in the epigastrium followed by uncontrollable vomiting and great prostration. The symptoms resisted internal and hypodermatic medication and were considered to be indicative of ptomaine poisoning. This attack and the prostration following lasted nearly a week. Since that time he has had similar attacks and less severe attacks once a month or oftener. Aside from this he complains of nothing except easily induced fatigue, of insomnia and mental irritability. Examination revealed Argyll-Robertson pupils, absence of the tendon-jerks in the lower extremities; slight ataxia of station, slight ataxia of gait on walking backward, distinct disturbances of sensibility; hypesthesia and analgesia in the peroneal areas, and Biernacki's sign. Despite the fulness with which the disease was represented objectively, no other symptoms than gastric crises appeared for nearly three years after the first attack. Then he began to complain of shooting pains in the legs, of paresthesia in the feet and legs and later of difficulty in passing urine, particularly if he neglected to pass water at stated intervals. Until the present time, nearly seven years after the initial symptoms of tabes, no other symptoms save the gastric crises and occasional attacks of pain have become conspicuous.

Case V.—Tabes With Arthropathy. Painless Enlargement of a Joint the Initial Symptom.—As a typical illustration of such a case, I cite the following history: J. R., thirty-five years old; syphilis when sixteen years old. Extensive secondaries; treated for about six months. Two years ago the left ankle began to get large without attributable cause. The swelling was unaccompanied by pain. In about four months the swelling went down somewhat, but it has never been well since then. The condition of the joint at the time he came under observation is shown by the accompanying photograph. He has been under almost continual treatment for rheumatism. Aside from this he does not complain, but when questioned says that he has a "sciatic" pain which comes occasionally in the left pectoral muscle, and during damp weather shooting pains in the knees. He has difficulty in holding the urine at times; when he wants to start the stream he cannot; he urinates more easily when sitting than when standing. This, with progressive impotency, dates back one year. He also admits occasional diplopia and numbness of both forearms, especially along the course of the ulnar nerve. Examination shows Rombergism, slight ataxia of gait, slight ataxia of the upper extremities, the knee- and ankle-jerks are absent. Plantar, cremaster and epigastric reflexes present, and of

Fig. 2.



Arthropathy of the ankle which developed early in the course of tabes.

normal type. Analgesia over the entire surface of the legs, arms and forearms, and hypesthesia over the same areas. The pupils respond to light and accommodation, the optic nerves are pale.

Case VI.—Tabes With Early Optic Atrophy.—The following history is cited to illustrate the type of case in which optic atrophy is an early symptom. This in contradistinction to the cases of tabes that develop optic atrophy during the course of the disease. A married woman, fifty-four years old, was seen July 7, 1900. She dates the beginning of her disease to June, 1899. Before then, however, she had been very nervous and suffered from occasional attacks of vomiting and diarrhea without attributable cause. She had diplopia at times, especially when looking downward. Numbness of the fingers and toes was complained of four months previous to the onset of blindness, which she considers to be her disease. In June, 1899, she noticed for the first time difficulty in sewing and reading on account of defective sight. The impairment was most marked at first in the left eye. The loss of vision was rapid and within a year it had so far disappeared that she could only tell light from shadow. Examination shows the pupils small, of equal size, and unresponsive to light. The optic nerves show a typical picture of primary atrophy. The knee-jerks and ankle-jerks cannot be elicited. There is slight but distinct ataxia of station and locomotion, but no ataxia of the upper extremities. There is well-marked hypotonia. At this time the patient maintained that there were no symptoms referable to the bladder, but later admitted incontinence.

Case VII.—To Illustrate Type in Which Motor Symptoms Predominate.—Mr. X., forty years old; occupation, gambler. Syphilis when twenty years old, ordinary cutaneous and mucous membrane accompaniments. Treated locally and internally by a syphilologist for "a long time." First symptoms of tabes 14 years after luetic infection, consisting of lassitude, sensation of numbness around the anus, tired feeling over the sacrum. He was treated for enlargement of the prostate, but without relief. Within a year after the initial symptoms he began to have pains in the legs. The pain would shoot through the nerves as if he were stabbed, then it would settle down in a spot and recur intermittently for four or five hours. The frequency of these attacks varied. About a year later he first noticed difficulty in walking, he would become agitated in crossing a crowded street, he became uncertain in going down stairs and in walking through a narrow passageway. About the same time or earlier he remarked that he was becoming impotent and a few months later he experienced difficulty in micturition. Sometimes he would have to wait and press down hard before the stream would start, at other times there was incontinence. He complained also of a tight band sensation around the waist; of a sensation in the hands as if the skin were tightly upon the stretch, and of a sensation in the fingers as if thin layers of gutta percha were over them. The difficulty of station and locomotion increased rapidly and within four months after its appearance he was unable to walk unaided. He rapidly became bedridden and remained so for nearly a year, during which time his general health improved. He then began to gather capacity to stand and slowly he learned to walk and soon was able to get around with the aid of a stick, but within a year he became practically bedridden again.

The examination showed: (1) ataxia of gait and station; (2) absence of the knee- and ankle-jerks; (3) pupils unresponsive to light, but contract quickly to accommodation; (4) analgesia over the entire surface of the lower extremities and delayed tactile sensibility; (5) pressure upon the ulnar nerve at the elbow causes no discomfort and there is well-marked analgesia over the ulnar distribution; (6) hypotonia very marked in the lower extremities, the patient can take the right foot with the right hand, and the knee being extended, draw it up on a line with the head; (7) the plantar, cremaster and abdominal reflexes are elicitable, the response of the two last-mentioned being slow; (8) pulse varies between 90 and 95; (9) fundus of the right eye normal, fundus of the left eye showed a deep physiological excavation.

Case VIII.—Benign Tabes.—The following case illustrates what has been called a benign form of the disease, and it shows the necessity of basing the diagnosis upon the elicitations of an examination. S. L., a Jewess, forty-five years old, came to the clinic complaining of headache and of vertigo, which she said were of about four months' duration; it was for this that she sought relief. There were no indications from casual examination that there was anything else the matter with her. Inquiry reveals that while she was nursing her second child, a boy who is now eighteen years old, that there developed upon the nipple of her right breast an eating ulcer, which she says came from a sore upon the child's lip, diagnosticated by the physician who was in attendance as a chancre, and which required five months' time in which to heal. The child developed cutaneous and mucous membrane secondaries and, although he has been under almost continual treatment from that time until the present day, he has still osseous manifestations of syphilis which are ameliorated by taking very large doses of iodide of potassium. The mother did not take medicine very regularly after the initial infection, and in consequence the child that was born next had an extensive syphilitic eruptation and died at the age of three months. After this the mother took medicine all the time, inunctions and iodide of potassium, and the next child was born alive and healthy and has been well since. Then followed a dead child, a miscarriage, and finally, six years ago a healthy child which is now all right.

On interrogation the patient says that for the past eight years she has had shooting pains in the

legs, first in one part then in another, each time lasting from one to five seconds and they are often of such severity that they draw the leg up. Sometimes an attack of such pains lasts as long as twenty-four hours, but usually not more than three or four. She is quite sure that they are worse in wet weather. About five years ago her feet troubled her a great deal; she felt that she was constantly walking on sharpened nails, but for the last two years this has not been so severe. Occasionally she sees double, and often girdle sensation is very annoying. Aside from this there are no symptoms. She says that she has no difficulty in gait or station, and if it were not for the attacks of indigestion and easily induced fatigue she would not know that there was anything the matter with her aside from headaches and vertigo, which she considers to be her disease and for which she seeks relief.

Examination shows slight ataxia of station, no ataxia of locomotion; slight inco-ordination in the upper extremities; absent knee and ankle-jerks; Argyll-Robertson pupils; preservation of the accommodation reflexes; slight hypesthesia over the distribution of the peroneal nerve (no other sensory disturbance); perversion of the muscular sensibility in the legs; none in the arms; marked hypotonia of the legs, when the patient is lying on the back, the extended leg can be brought to a right angle with the trunk; slow, but easily elicitable plantar and abdominal reflexes; pulse 92; no vasomotor symptoms; no involvment of the special senses.

Case IX.—Initial Tabes.—The following may be taken as an example of initial tabes. It will likewise illustrate the course of the disease in the earlier part of its career. D. W., thirty-eight years old. Syphilitic infection when twenty. Complains of pain in different parts of the body, arms, legs and back. "The skin hurts him." "During the night the feet get stiff, and after sitting in the day they feel numb." Duration of these symptoms six months.

Examination: Pupils unequal, sluggish, light reaction, especially in the left pupil, with perceived contraction to accommodation. No motor paralysis, no ataxia of gait or station, no Romberg symptom. Tendon jerks fairly normal. An area of hypesthesia at the level of the sixth dorsal vertebra, especially on the anterior surface of the trunk. Distinct hyperesthesia over the remainder of the trunk, arms and legs, especially in the latter. The slightest contact is very disagreeable to him and the touch of the underclothing hurts him.

Examination one and a half years later shows ataxic gait, Rombergism, unevenness of the pupils, Argyll-Robertson phenomenon. The tendon jerks are absent, there is anesthesia of the feet, legs and trunk, and delayed sensibility in the legs; in other words, the most typical accompaniments of tabes.

When the patient came first under observation in the dispensary the diagnosis was made upon the history of pain, the condition of the pupils and the anesthesia of the chest. It would perhaps be difficult to defend a diagnosis made upon these three symptoms alone, but the results of the examination eighteen months later show how fully it was justified.

Case X.—High Tabes.—Male, forty years old, became infected with syphilis when twenty-two years old and received treatment only during the local lesion and the erythema that followed it. The initial symptom of tabes consisting of pain in the lower part of the back appeared when thirty-two years old, *i.e.,* ten years after the syphilitic disease. He did not consider himself sufficiently ill to seek medical advice, however, until four years ago, when paresthesia in the thumb, index finger and right hand developed. The next symptom to develop was shooting pains in the hands and impaired coordination which interfered with his work, that of making neckties. After this he noticed a sense of uncertainty in walking in the dark, difficulty in going downstairs, incontinence of urine, difficulty in defecation, loss of the expulsive capacity. The next symptom to develop was a severe and uncontrollable paresthesia and itching of the right orbital region which has persisted until the present time. At times this was associated with photophobia. During the year before coming under observation he had occasionally complained of diplopia. Examination shows ataxia of gait and station, a moderate degree of double ptosis, mild convergent strabismus, pupils irregular, uneven, no response to light, response in accommodation; ataxia of the upper extremities, absence of the triceps-jerk, ataxia of the lower extremities; knee-jerks elicitable, right Achilles-jerk absent, left present; disturbance of tactile, pain and thermal sensibility in the upper extremities and over the thorax. Deep sensibility of the upper extremities very much impaired.

Case XI.—Cervical tabes with bulbar involvement.—Mr. G., forty-four years old, married, a driver, was seen at the clinic in September, 1902. Family history not important. His wife has had two miscarriages. Has never had rheumatism or rheumatic pains. Smokes and chews tobacco excessively and is intemperate in the use of alcohol. Eighteen years ago he had a chancre and was treated externally and internally one month; no secondaries. He has had two attacks of gonorrhea. No history of trauma or of gastro-intestinal trouble. Seven years ago he had difficulty in urination and a stricture was detected and cut and the symptom relieved. The first symptom of the present trouble developed two years ago: while driving along the street he would see double, one image above and outside the object. This diplopia was not constant. Then intermittent ptosis of the left eye accompanied with lacrymation developed; (2) difficulty in chewing on the left side, especially in masticating tough food; (3) difficulty in voiding urine, involuntary intermission of the stream; (4) sensation of soreness and hyperesthesia of scalp; (5) progressive

weakness of the musculature of the lower jaw; (6) numbness of the cheeks and face, especially on the left side; (7) alteration of the voice, followed by hoarseness and difficulty in swallowing; (8) drooling; (9) peculiar tracheal cough without apparent cause, and choking sensations, relieved at times by raising mucus; (10) paresthesia of the throat. A few months ago he developed (11) regurgitation of fluids through the nose; after its existence for two months it became much less severe. Now solids are swallowed easily. The sense of smell is impaired on the left side; taste and hearing normal. About three months ago he noticed unsteadiness in walking. This was particularly manifest in going up and down stairs. At times he would stagger as if he were drunk. This had become progressively worse. Weakness of the muscles of the neck began to develop a few months ago. Vision has been impaired three months. Weakness of the tongue has existed since two months. Ataxia of the hands has existed three months. No precordial pain, anxiety or palpitation; no gastric or other crises; no girdle sensation; no lightning pains. Incontinence of urine has been troublesome for four months.

Examination shows a tall, poorly nourished individual, with conspicuous, tortuous temporal arteries and peculiar, relaxed, inattentive facial expression. The pupils are equal, of large size; they reach sluggishly to light, directly and consensually, but promptly to pain stimuli and in accommodation. Movement of the eyeballs in outward and upward directions is much impaired. On forced outward movement it is accompanied by nystagmus-like twitching. The right palpebral aperture is smaller than the left. Ptosis of the right upper lid is nearly complete. The forehead cannot be wrinkled. Weakness of the orbicularis palpebri is shown in inability to close the eyes on the greatest effort. The lower jaw hangs indifferently and is ever in apposition with the upper jaw. Although it can be approximated to the latter it immediately drops away, the jaw-jerk is absent and there is marked wasting of both temporal and masseter muscles. There is distinct reaction of degeneration to the faradic and galvanic current. There is constant drooling. The patient has difficulty in puckering the mouth and with intrabuccal movement of the tongue. There is hypesthesia over the upper face on both sides and hypalgesia amounting in places to analgesia over the same area. The sensibility of the lower part of the face is very well preserved. There is much more weakness of the left half of the tongue than of the right. The sense of taste is normal, that of smell much impaired. The pharyngeal reflex is lively. There is paralysis of the left recurrent laryngeal and some paresis of the right pharyngeal nerve. The voice is hoarse, raucous, and a peculiar tracheal cough is very disturbing.

There is some wasting of the sternocleidomastoid muscles, and to a much lesser degree of the trapezii. Fibrillary twitchings in the muscles of the shoulder girdle are apparent. The tendon reflexes of the upper extremities cannot be elicited. There is increased fasicular myotatic irritability, the muscles themselves are very flabby. The knee-jerks and ankle-jerks cannot be elicited and the tendons are very soft. The superficial reflexes are preserved and normal. Motor power is diminished all over the body, but there is no atrophy of the lower extremities. Deep sensibility is impaired in the lower extremities, preserved in the upper extremity. There is slight swaying on standing with the eyes closed, and the body is made decidedly unsteady on attempting to walk with closed eyes. Pain sensibility is disordered in the legs, the dorsal surface of the feet, the abdomen and the face. In the same areas there is delay in the interpretation of tactile stimuli and hypesthesia. There is pronounced hypotonia of the upper extremities and of the lower extremities. The pulse is 120, the tension below normal, the vessel walls degenerated. Ophthalmoscopic examination is negative. Examination of the urine shows nothing abnormal save diminution in the amount of urea and the existence of a few hyalin casts.

INITIAL SYMPTOM OF TABES.

The initial symptom of tabes was elicited with much care in all cases, but espetially in those that were seen in private practice. The results of this elicitation are stated in the accompanying table. In some instances, especially those encountered in hospital practice, the patient had forgotten what the earliest symptom of his disease was, or he had lost track of the order in which the symptoms had developed. One thing that has impressed itself upon me in studying the initial manifestation of tabes is that the symptom which the patient says were the first to occur are often found not to be the earliest indications of the disease. They are merely the symptoms which have given him enough trouble to prompt him to consult a physician. This may account in a great measure for the relatively small proportion of cases in my statistics in which pain is stated to be the initial symptom. Again and again I have had this experience: In response to the question, "What was the first symptom of your present trouble?" the reply was "pain in the legs," or "pain and numbness of the feet," but on close inquiry find that for a considerable time previous to the occurrence of this symptom the patient had experienced inexplicable leg weariness, tired, sore feeling over the coccyx and sacrum, delay in starting the urinary stream or the necessity for bearing down hard in micturition, falling off in sexual vigor and copulative capacity, transient attacks of diplopia and so on.

The initial symptom was noted in 126 cases. The accompanying table states the results:

	Cases.	or Per Cent. of 126 Cases.
Shooting pain in leg.....	31	24.6
Vague pain in side.....	2	1.58
Sticking pain in lumbar region.	2	1.58

Pain in heel	3	2.38
Pain in groin, knees and legs	1	0.79
Vague pain	6	4.76
Shooting pain about waist and radiating to leg	2	1.58
Pain in back (throbbing)	1	0.79
Severe spot-pain	1	0.79
Head pain (neuralgia)	2	1.58
Difficulty of urination, or incontinence	7	5.55
Loss of sexual power	4	3.17
Giving way of legs	6	4.76
Weariness of legs	6	4.76
Ataxia	6	4.76
Vertigo	3	2.38
Numbness of arms	2	1.58
Nocturnal emissions	1	0.79
Gastric crises	6	4.76
Rectal crises	1	0.79
Pruritus (intolerable itching all over)	1	0.79
Ulcer of the foot	2	1.58
Ptosis	5	3.96
Weakness of knees	6	4.76
Numbness of feet	5	3.96
Psychroesthesia of knee	1	0.79
Numbness of leg	5	3.96
Diplopia	7	5.55
Partial paralysis of leg	1	0.79
Patient does not recall, or not particularly specified	14	11

Pain in one part or another of the body was the initial symptom in 51 cases, in 40 per cent. These figures do not agree with those of other investigators, and for the reason already mentioned. For instance, v. Sarbo, in a recent study (*Deutsche Zeitschrift für Nervenheilkunde*, Vol. 23, 1902), states that lancinating pain was an initial symptom in 67 per cent. of his cases.

Pain: Its frequency, character and seat in tabes.—In contrast with the relative infrequency with which pain was noted as an initial symptom we have the statistics showing how often pain was noted as a symptom in the course of the disease. One hundred and twenty-six of the 140 patients complained of pain in one form or another *i.e.*, 90 per cent. of the cases. These figures, indicative of the frequency of pain in locomotor ataxia, are in harmony with those of Bramwell (Brain, 1892), 95 per cent.; Gowers (Disease of the Nervous System, Vol. I.), 90 per cent.; Leimbach (*Deutsche Zeitschr. f. Nervenheilkunde*, Vol. VII., 1895); (Erb's Cases), 88.25 per cent., and Riley (*Journal of Nervous and Mental Diseases*, 1898), 89 per cent. In the statistics of Bonar (Starr's Cases, *Journal of Nervous and Mental Diseases*, May, 1901) pain was made out only in 79 per cent.; and Thomas (*Bulletin of the Johns Hopkins Hospital*, 1899, Vol. X.), 54 per cent. The infrequency of pain as a symptom of tabes in the statistics of the two last writers is to be explained, I believe, by the fact that their cases were largely dispensary patients. In my own dispensary patients' pain was complained of less frequently than by patients in private practice. It is not that tabic patients who seek relief in dispensaries do not have pain just as often as others, but that they go there to seek relief for some symptom whose existence prevents them from earning a livelihood, and is therefore of more importance to them. They may not volunteer a history of pain, but when their history is elicited carefully pain of some kind will be found to exist in the vast majority of them. Another point that should be referred to is that the pain is not always "shooting" by any means. Although pain thus best designated is the most common variety, "burning," "tearing," "tingling," "rheumatic," are some of the designations not infrequently used. Cases in which there is pain thus described should be (and are in my statistics) reckoned among those in which pain is a symptom.

The portion of the body in which the pain was manifest and the patients' characterization of the pain are shown by the following table:

Predominant Seat of Pain.—

	Cases.	or Per Cent. of 126 Cases.
Lower extremities	84	67
Upper extremities	5	4
Head	4	3.1
Back and trunk	11	8.7
Abdomen and trunk	11	8.7
Testicles	3	2.3
Everywhere	8	6
In the lower extremities and elsewhere	121	96

Thus it will be seen that in the 126 cases in which pain was a symptom it was, according to the patient's statement, predominantly in the lower extremities in two-thirds of the cases. In the 42 remaining cases it was of greater severity in other portions of the body, as shown by the table. In almost all the cases (*i. e.*, 121 out of 126) in which pain occurred in other parts of the body, it occurred also in the lower extremities.

The character of the pain as noted in the history, the designation either of the patient or the interlocutor is as follows:

	Times.
Shooting, or sharp shooting	49
Stabbing, cutting, lancinating	18
Lightning pains	14
Darting, jumping, trolley-pain, zig-zag	7
Rheumatic and neuralgic	13
Boring, screwing	6
Dull, aching	4
Trembling	2
Electric	2
Breaking	2
Twitching, stinging	2
"Terrific"	2
Prodding with a bunch of needles	1
Plunging a triangular red-hot file into the legs and twisting it around	1
Vague	1
Like a toothache	1
Sciatic pain (in the chest)	1

Factors which, according to the patient, seemed to increase the frequency and severity of the pain were noted as follows: Inclement weather and abrupt barometric variation, 38 cases; cold

weather and exposure to cold, eight cases; fatigue, 17 cases; excitement and emotional exaltation, four cases; indigestion, five cases. In about one-half of the cases the patient was unable to say what influenced the pain to greater severity or frequency. In 12 instances it is recorded that there was an elevation of temperature of from one-half to two degrees during the paroxysms of pain, and in seven subnormal temperature following severe paroxysms. In a few instances it is noted that swelling of the veins accompanied the pain.

Of the 14 cases in which pain was not a symptom five were seen in my clinic, three in consultation and four in private practice. Eight of these 14 cases were in the pre-ataxic stage. Three of these developed ataxia without accession of pain. Six of the 14 of whom I am able to get information at the present writing have still not had pain. (Case III. is an excellent example of such a case.)

Crises.—Visceral crises were noted as having occurred in 20 of the 140 cases, *i.e.*, in 14 per cent. The viscera to which the attack was referred was as follows: Stomach, 11 cases; rectum, four cases; larynx, two cases; intestines, one case; larynx and pharynx, one case; stomach and intestines, one case. It is worthy of note that in six of these 20 cases the symptoms of gastric crises were the initial symptoms.

In one case which has been under constant observation for eight years, the patient has had but five severe attacks. The manifestations of tabes were ushered in by a profound attack of stomach and intestinal crises nine years ago. It is also worthy of note in view of the fact that it is widely believed that the tabic process is often arrested by blindness, that this patient has had two attacks since blindness became complete. In no case has crises occurred without pain.

Patients in whom gastric crises, or any other crises, for that matter, are the initial symptoms are rarely diagnosticated correctly until the disease has lasted for a considerable length of time. As a result they are infrequently subjected to treatment which, to say the least, can be of no benefit. To illustrate this the following case may be cited briefly: W. S., thirty-eight years old, infected with syphilis when twenty-three, sat down to eat his dinner one day when he was twenty-eight years old (*i. e.*, five years after his specific infection), experienced nausea, vomited a number of times and felt extremely ill. These attacks recurred every few days for about three months, during which period he was treated for stricture of the esophagus. He did not work for about two years after this attack because of loss of strength, easily induced fatigue and the occasional recurrence of the vomiting spells. At the present time he seeks relief for the following symptoms: Every morning at four o'clock he has a desire to go to stool, then he is taken with sharp pain in the abdomen, which is frequently followed by vomiting or by diarrhea. Inquiry reveals that he has occasional sharp, shooting pains in the region of the heart, difficulty on descending stairs, in walking in the dark, in standing at a basin and washing the face in the customary way, in starting the urinary stream and that he is impotent. Examination reveals ataxia of station and gait; absence of the Achilles jerks; absence of the knee-jerks, except the right, which can be brought out very feebly on reinforcement; unequal pupils, the left widely dilated, not responsive to light, the right dilated and responds very slightly; hypesthesia over both arms and to a lesser extent a narrow band across the fifth intercostal space; hyperesthesia over the abdomen and back. The plantar, cremaster and abdominal reflexes are present.

In other words, a typical case of tabes in which none of the customary symptoms was complained of until the patient was interrogated very closely.

Paresthesia.—Paresthesia is one of the commonest symptoms of tabes. It is nearly as constant as pain. Its occurrence was noted in 103 of my 140 cases, *i.e.*, in 73 per cent. v. Sarbo (*loc. cit.*) found paresthesia in 72 per cent. of 172 cases. When it is not mentioned in the histories it is reckoned that it did not exist. This may not be quite legitimate, for it may have been not noted in a number of instances in which it existed in a mild degree, because the patient did not speak of it and because he was not directly interrogated concerning it. Paresthesia is differently described by different patients, just as pain is. The commonest designation is "numbness;" "loss of feeling" (39 instances); "numbness and tingling;" "pins and needles;" "crawling sensation;" "cotton sensation;" "parchment sensation;" "a veil across the face" (48 instances); "sensation of cold, and of heat and burning;" sensation of being wrapped in something;" "tickling sensation;" "tight sensation in the lower part of the spine;" "sensation of the insides falling out or down;" "all-gone sensation in the seat;" "sensation as if walking on steel brushes" (37 instances). The distribution of the paresthesia was distributed as follows: Lower extremities, 46 cases; trunk and viscera, 16 cases; lower extremities and trunk, 18 cases; upper extremities, 13 cases; face and head, 10 cases.

Paresthesias are important symptoms in nearly every case. In some these are dominant, as in the following case: M. H., a Polish Jew, thirty-eight years old, contracted syphilis during his twenty-third year and received hospital treatment for about six weeks. When twenty-five years old there developed, nine days after taking a warm bath, intolerable itching of the surface of the entire body from the head to the toes and finger tips. This lasted about two months, sometimes better, sometimes worse, but it has never entirely disappeared. On being questioned closely he recalled that he had similar attacks in Russia as long ago as ten years before. These attacks were characterized by itching in one part of the body or another and a sensation of tension in the head,

neck, face and eyes, as if these parts were being squeezed. Such an attack would last "an hour or so," and following them he would be very tired. He does not recall their frequency, but he thinks he did not have more than one or two a year. A few months after the onset of the attack for which he consulted me pain in the legs and toes developed. The pain was intermittent, lightning-like and came in attacks, each attack lasting a few hours. After an attack the paresthesia was more severe. Following a severe attack of pain he is dispirited, weak and listless.

There are no symptoms pointing to impairment of function of the sphincters or the sexual sphere. Examination shows *both Achilles jerks absent,* the left knee-jerk elicitable, the right not elicitable except on reinforcement and then only very sluggishly; ataxia of the right lower extremity; slight Rombergism; no ataxia of gait; no ataxia of the upper extremities; no distinct hypotonia. The pupils are equal and react to light and in accommodation. Examination of the sensory sphere shows areas of analgesia, irregular in distribution over the lower extremities and at the borders of these areas, hyperesthesia and hyperalgesia. When he sits on a cold surface, the naked skin in contact, he complains of great pain, burning in character until the cold surface gets warm. Marked hyperesthesia to cold all over the body. Two years later both knee-jerks were absent; he was beginning to show some ataxia in gait; the pupils were *unequal* and the left decidedly sluggish to light.

Among other things which the history of this case shows is the disappearance of the Achilles jerks before the knee-jerk, and the prolonged period that paresthesia and pain may be present before other symptoms of tabes. Similar cases are to be found in the literature (Goldflam, *Neurologisches Centralblatt,* 1902, p. 786).

Paresthesia in the domain of the fifth nerve is often most annoying, especially when it takes the conjunctival form, described by the patient as if there was "sand in the eyes." In two patients this has been most distressing. Paresthesia of the head, feeling of compression in the occiput principally was noted oftener in dispensary patients than in patients in private practice. The large proportion of Russian Jews in the dispensary cases and their tendency to disturbance of sensibility may account for this. In one instance (private patient) thermal paresthesia was extremely annoying. The patient complained of a sensation of great head and burning in the feet. To have his boots blacked while they were on his feet was most disagreeable and oftentimes gave rise to intolerable pain.

Girdle Sensation.—A sensation as though a girdle or band was around the lower portion of the trunk is usually considered to be a frequent symptom of tabes. In my cases the presence or absence of the girdle sensation was noted in 30 per cent of the cases. It is recorded as present in some degree in 46 cases, and as not present in 59. That is, it existed in 45 per cent. of the cases in which it is certain that specific inquiry was made. It is probable that most, if not all, of the remaining 35 patients were questioned upon this point and the answer being negative it was not recorded. If the percentage is computed for the entire series it would appear that about one-third of the patients had girdle sensation, an inconstancy of occurrence that does not entitle it to rank as one of the leading symptoms of tabes. The information on this point, furnished by my statistics, is not much at variance with that of other recent writers, and it may therefore be taken as representing approximately the value and importance of this symptom as an aid in diagnosis. As a matter of fact girdle sensation is one of the paresthesiæ of tabes, and is not entitled to consideration as a symptom apart from them.

Disturbance of Tactile Sensibility.—Objective sensory disturbances of one kind or another are the most constant accompaniments of tabes. They exist not only when the tabes is well developed, but in its early stages as well. They are not infrequently overlooked. It requires careful and systematic examination of the cutaneous surface of the entire body to detect them. Casual examination of the feet and legs, which unfortunately we often limit ourselves to, in searching for sensory disturbances, does not reveal them with anything like the frequency with which they really exist. I have been very much impressed with the truth of this, because in the 40 last cases carefully examined that have come under observation there has been found objective sensory disturbances, particularly of the trunk, in 24 of them, 60 per cent. I am sure that if all of the cases constituting this series had been examined with the same care that these last cases were the percentage of cases showing sensory disturbances would be greater than my statistics show it to be. Still I call attention to the fact that I have not found disturbance of tactile sensibility with anything like the frequency that some investigators have, not even the anesthesia of the trunk first described by Hitzig. For instance, it was found in 92 per cent. of the cases by Förster and Fränkel, 91 per cent. by Löhr, 85 per cent. by Patrick, 71 per cent. by Bonar, 40 per cent. by Williamson. These were the determinations of investigations undertaken especially to show the existence or absence of diminution of tactile sensibility of the trunk.

Disturbances of tactile sensibility, *i.e.,* anesthesia, hypesthesia and hyperesthesia were found in the trunk alone in 26 instances, in the trunk and lower and upper extremities in 61 instances, in the trunk, lower and upper extremities and face in seven instances. In other words, disturbance of tactile sensibility was noted in 67 per cent. of the cases. This seemingly large percentage of cases may be accounted for by the fact that examinations were made carefully, and that it had been impressed upon the examiner many times that areas of hypesthesia, slight diminution of tactile sensibility detected in the early stages of tabes, become transformed later into two distinct

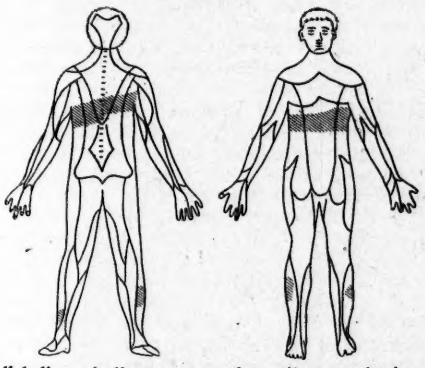
areas of anesthesia. In two cases the anesthesia involved the face, gums, teeth and tongue. It is worthy of note that in both instances the patients had previously complained of distressing paresthesia in the same regions.

Anesthesia of the legs was noted in 54 cases. In 39 cases the absence of anesthesia in the lower extremities was noted. In 47 cases the findings of examination for tactile sensibility are not recorded. Estimating the percentage of disturbance of tactile sensibility in these 93 cases we find it to be 58 per cent.

It may therefore be said that diminution of tactile sensibility is an early and rather constant objective sign of the tabes. Casual examination for sensory disturbances will not, however, reveal it. In every case the trunk and the extremities should be examined carefully by means of a camel's-hair brush, a bit of cotton wool, or of the finger which has previously been plunged into hot water so as to deprive it of surface coldness, if necessary.

The commonest distribution of tactile disturbance in the beginning of the disease is to the

Fig. 3.



Parallel lines indicate area of tactile anesthesia case of early tabes.

trunk, the area corresponding to the fourth to sixth dorsal segments. The anesthesia may be extremely slight in early tabes but it usually intensifies and extends as the disease advances. The lower extremities, however, show this form of sensory disturbance nearly if not quite as often as the trunk, and in the latter stages of the disease hypesthesia or anesthesia of the legs is almost invariably found. Lessened keenness of tactile sensibility has little or no relationship to the duration of the disease, but intensity of disturbance has. Disordered tactile sensibility is quite as likely to be present early in the disease as it is later, but it is rarely intense, while when the disease is advanced it is quite likely to be so. It is well known that one of the distinguishing features of the disturbance of tactile sensibility in tabes is that it is "segmental" in distribution, *i.e.*, it conforms in its delineation to the sensory distribution of segments of the spinal cord, *i.e.*, of spinal nerve roots, and not to the distribution of peripheral nerves.

(To be Continued.)

MEDICAL PROGRESS.

OBSTETRICS AND GYNECOLOGY.

Hysterectomy for Fibroids.—The operative records of 50 cases of abdominal hysterectomy for fibroids is given by C. J. POND (Lancet, Jan. 17, 1903), from which he draws the following deductions: The position as to operation depends on the danger to life and the degree of displacement, of ill-health and of suffering caused by the disease. The social condition of the patient is a factor. Comfortable invalid life is incompatible with poverty; therefore, the disease must be removed among the poor, in order to return them to working capacity. Among the more wealthy classes, moral, mental and physical degeneration follow long-continued invalidism, which would be good grounds for operation, when other conditions permit. Whenever the disease causes displacement, hemorrhage, pain and pressure sufficiently severe to threaten damage to the general health, to the nervous system, to the pelvic organs, the operation should be advised. Cervical hysterectomy has a lower mortality (about 4 per cent.) and is preferable to ovariotomy in this particular. The uterus may safely be impacted at this level, and the absence of recurrence in the error is an argument for this form as against panhysterectomy. In the former the pelvic floor is left intact; in the latter it is damaged. Myomectomy is a valuable operation, and applicable for certain accessible tumors. In all possible cases, one or both ovaries should be left in and not removed. Convalescence is more complete, and the patient has no artificial menopause.

Congenital Hernia of Liver into the Umbilical Cord.—This rare and interesting condition was observed by J. W. BULLARD (West. Med. Rev., Jan. 15, 1903), in a child whose mother gave an indefinite history of syphilitic lesions, with one miscarriage and four living children. In the tissues of the cord was a pinkish, semisolid tumor about the size and shape of a hen's egg, and attached at the umbilicus by its smaller end. There was no impulse transmitted to the tumor when the child cried. The baby was small and weak, so nothing radical was done, and in the course of a week the coverings of the cord underwent their usual desiccation. On the twelfth day operation was attempted, and it was found that the tumor constituted about half of the liver, and was so firmly adherent to the hernial sac that it could not be replaced. The child died in twenty hours.

Tears Through the Vagina During Labor.—A most remarkable case is reported by BAUMBACH (Deut. med. Woch., Jan. 8, 1903), of a woman who, in three successive labors, sustained tears in the vagina which allowed the fetus to be expelled into the peritoneal cavity and made a complete recovery every time. Patient was a small, weak woman, with marked kyphoscoliosis and an anchylosed right hip-joint. She had six previous pregnancies, once twin, all normal. At the seventh labor one child was born without assistance, and a second diagnosed as present. After a strong pain the woman suddenly fainted and the uterine contractions stopped. Several hours later the uterus was tightly contracted. Several coils of gut were found in the vagina, protruding from a tear in the posterior cul-de-sac. The child was then made out in the abdominal cavity, with the fetal membranes intact. The latter were ruptured, a foot pulled and the fetus readily extracted. A quantity of gauze packing was introduced and the woman made a good recovery. Two years later she was again pregnant, and went into labor with the child in the transverse position. The same collapse took place, and examination again disclosed the fetus in the abdominal cavity from

which it was readily extracted. A year and a half later the phenomenon was repeated with equally good results, the fetus in every case having survived and the patient making an excellent recovery.

Puerperal Eclampsia.—The causative factor in this malady has as yet eluded every effort at discovery. EDWARD T. ABRAMS, (Am. Jour. of Obstet., January, 1903), states that it is now conceded that the eclamptic symptoms are dependent upon some form of auto-intoxication, and it seems quite certain that this condition is brought about, at least in the first instance, by insufficient metabolism and subsequently by insufficient secretion. The condition is so rare that only those of large clinical experience can see many cases. It is most common from the seventh to the ninth months. The relation of the thyroid to eclampsia is very interesting. An enlargement of this gland takes place in primipara about the sixth month, and in multiapara about the fifth. The function of the thyroid is to regulate metabolism. Lange has demonstrated the enlargement is physical, or rather physiological. In twenty out of twenty-five cases of pregnancy, in which enlargement of the gland did not take place, albuminuria and convulsions did develop. Herzfeld holds that pressure on the ureters is an etiological factor in the causation of the disease. In his 81 fatal cases, all showed pathological chang s in the uropoietic tract. The effort to prove that eclampsia is identical with uremia, has gone down as "not proved." However, it is the incomplete urea in the blood that (in the form of toxins) doubtless causes the convulsions. Therefore the diminution of the urea in the urine ought to be to us an indication that the toxins are being retained. The urinary tract must not alone be watched, but the other organs should receive their quota of our attention. Jaundice is always a very grave symptom. It is a good rule to consider every pregnant woman constipated until otherwise proved by a competent nurse. The experiments of Tarnier, Ludwig and Savor certainly show that the toxicity of the blood serum is increased in eclampsia, while, on the other hand those of Charrin and Volhard seem to prove just as conclusively that it is not. In treatment, prophylaxis stands preeminent. When the trouble has developed the treatment may be summed up in one word, "elimination," and nothing will give such immediate results as blood letting, followed by infusion or transfusion of saline solution. If the patient be anemic, do not bleed, but use the saline injection. The results of such treatment observed to the effect that: (1) The patient's general condition will improve; (2) the cyanosis, muscular twitching and rigidity will have ceased; (3) the pulse, which before was hard and bounding, will have lost its tenseness, and the attendant coma, be it ever so deep, will slowly but surely be lifted. The writer says in conclusion, that if blood letting, together with saline infusion or transfusion, were more generally employed, better results would be obtained in the treatment.

Removal of Vesical Papilloma.—A new and interesting operation through the septum, with the patient in the knee-chest position, is advanced by HOWARD A. KELLY (Am. Jour. of Obstet., January, 1903). According to the author an artificial anemia is established with the patient in this position and whatever blood escapes runs down into the bladder, and in no way obscures the field of operation. The patient is anesthetized and put in the knee-chest position. Air is then let into the empty bladder, when an anterior-posterior incision is made in the median line about five centimeters long, by plunging a curved knife through the septum. The edges of the incision are drawn apart, after which the tumor is grasped and drawn into the vagina with the adjacent bladder wall. The pedicle which was present in the author's case, was transfixed well away from the tumor in the vesical wall, and tied both ways. A silk suture was used. The vaginal wound is then closed with fine silver wire sutures through the entire thickness down to the vesical mucosa, leaving a small opening to drain the bladder for a few days, to drain any coexistent infection. For this a mushroom catheter is used. This is removed after eight or ten days and the wound closes spontaneously. When the wound has closed, the patient is put in the knee-chest position and the silk suture removed through a No. 10 speculum. The method of operating in the knee-chest position has a wide range of applicability in bladder work, being well adapted for the removal of vesical tumors. The distended bladder in this position is far less vascular than in any other position. What blood escapes falls into the vertex and does not obscure the field of operation. The cut bladder wall is much thinner than in the contracted state. The vesical walls can be everted into the bladder to a remarkable degree; after pulling the tumor and the adjacent mucosa, the patient can then be put in the side posture to lessen the traction necessary to hold the mass, and the operation so completed. The bladder wall can be sutured after resection most securely in this way. Lastly, the easy removal of the stitch through the speculum makes it possible to use silk or even fine silver wire ligatures and sutures in the bladder in supra- and infrapubic operations with the expectation of taking the sutures out in this way at a later date.

The Mechanism of Posterior Presentation.—The variations in the form of the mechanism are dependent upon the size of the pelvis and upon the size and degree of flexion of the child's head. The greatest complexity manifests itself at the brim. SIGMAR STARK (Am. Jour. of Obstet., January, 1903), believes that there are four forms of mechanism encountered at the brim: (1) The entrance of the occiput in the "diameter of favorable engagement" with the head in the state of excessive flexion; (2) arrest of the occiput, descent of the sinciput, release of the occiput with re-establishment of flexion; (3) arrest of the occiput, descent of the sinciput, and conversion into a face presentation; (4) arrest of the occiput, descent of the sinciput, impaction and arrest of labor. When the occiput reaches the pelvic floor, and often even earlier the next phenomenon in the mechanism of labor becomes manifest. The occiput rotates either anteriorly or posteriorly. The requisites for anterior rotation are good pains flexion, and a relatively rigid pelvic floor. If the head be in a position of extension, the sinciput rotates anteriorly according to the law of obstetrics, that the most dependent rotates to the front. Good pains and a relatively rigid floor are essential in order to establish the proper balance between the forces of expulsion and resistance. In every case of labor in an occipito-anterior position when the occiput gets locked beneath the arch of the pubis, the following take place: The chin, being the only portion free to move, leaves the breast of the child and the head extends; the occiput is arrested; it can advance no further; it can rotate neither forward or backward; and finally the chin, as the only part of the head free to move, leaves the breast of the child and the head extends, and labor terminates as a face presentation. The occipito-mental diameter of the head is five inches, the oblique diameter is six inches; hence the extension of the head is entirely impossible. Probably this form of mechanism may occur, but the author cannot conceive that it is possible unless the head is undersized or easily molded.

The White Blood Cells During Pregnancy.—Childbirth and the puerperium cytodiagnosis and cytoprognosis after examination of the blood have assumed such vast importance that any light upon these subjects during important processes is valuable. The following points are offered by C. HAHL (Arch. f. Gyn., 1902, B. 67, H. 3): (1) During the last days of pregnancy the white blood cells are somewhat increased in number; (2) with the onset of the birth-pains, a rather marked hyperleucocytosis sets in; (3) this hyperleucocytosis is interesting chiefly in the polynuclear neutrophile cells; (4) during the puerperium this hyperleucocytosis is by regular stages decreased, so that as a rule during the first week the return to the normal relations within the blood is complete.

Pregnancy in Women Less Than Sixteen Years Old.—The question as to what age is the most proper for conception in mankind has been disputed for centuries, the two sides being summed up in the questions of social and bodily propriety. A. PATILLIE (C'blatt. f. Gyn., Dec. 27, 1902), after collecting together a large number of recorded cases in literature, formulates the following conclusions in the matter: (1) The course of pregnancy itself in women less than sixteen years old is normal, rarely ends in an abortion, but usually terminates in birth a little ahead of time; (2) the actual labor, has, on account of its short duration in such women, much less real suffering; (3) the necessity for operating in any way during such confinements need hardly be taken into consideration; (4) the prognosis with reference to damage to the birth canal in any of its parts is an exceedingly good one; (5) the puerperium is not in any way a departure from the normal; (6) for the fruit of the conception every possible prospect of the prognosis is good. The possibility of determining the youngest age at which a woman should conceive seems to be limited mostly by the dictates of nature, which has determined that the girl becomes a woman and capable of childbirth at about this age, which is, in fact, the time of life when her body is so arranged as to suffer least of all some of the evil consequences of childbirth.

Diagnosis of Tubal Abortion.—A contribution to the early diagnosis of hematosalpinx due to tubal abortion, is made by E. VIGNARD (Gaz. Méd., Nantes, Jan. 3, 1903), who reports twelve cases seen within a year. He holds that a diagnosis may almost invariably be made before rupture of the tube and hemorrhage into the peritoneal cavity have occurred, from the three cardinal symptoms, retarded menstruation, pain and uterine hemorrhage. Taking up these symptoms singly, he states that retarded menstruation is the rule, and the patient should be very carefully questioned concerning this, when it will be generally found that if there has not been a temporary cessation of menstruation, some modification of the last menstrual pediod will be discovered; the menses having been scant, abruptly checked or otherwise changed. Pain is the symptom for which the physician is called, and offers certain well-marked characteristics. It is always present, comes on suddenly like a colic, may be located in the lower part of the abdomen or over the entire abdomen, but its point of departure and of maximum intensity is in the region of the adnexa, upon the right or left side; and it is always unilateral. Its severity is variable and duration short, rarely lasting more than a few hours. It may be repeated in the following days and is sometimes accompanied with vomiting. Simultaneously with the occurrence of pain, there is a flow of blood from the vagina which is small in amount, so much so that it may not at once be noticed by the patient; but it is of long duration; sometimes continuing for weeks. These three symptoms should, in the author's opinion, at once suggest the diagnosis, which receives confirmation upon palpation through demonstration of the large, unilateral salpingian tumor; this being but slightly sensitive to pressure, save during the crises. The differential diagnosis of tubal abortion from nephritic colic, appendicitis and uterine abortion, the author gives as follows: In the first and second, menstruation is not retarded, and there is no flow of blood. In the last, with which tubal abortion is most frequently confounded, the discovery, by palpation, of the lateral tumor, clears up the diagnosis.

Putrefaction in the Lungs of Fetuses Without Respiration.—An added doubt is cast upon the dictum the lungs float, therefore respiration has taken place, by the experimental work of J. E. CLARK (Rev. de la Assoc. Méd.—Far. de la Isle de Cuba, No. 1, 1902), which seems to point to the possibility that putrefaction might take place in the lungs of fetuses which had not breathed, and that the gases so generated would be sufficient to cause the lungs to float upon water when removed from the body. The author procured the lungs of fourteen fetuses in whom it was positively known that respiration had not occurred, placed them in water, and, finding that they did not float, placed each pair in a vessel from which all air was withdrawn. The vessels were of uniform size, contained an equal amount of water, were hermetically sealed and kept at a uniform temperature. That putrefaction took place, despite the absence of air, seems evident from the fact that gaseous vesicles were seen upon the surface of four of the lungs, and nine floated to the surface after a variable length of time. Five did not come to the surface at any time, and in several instances, one lung floated to the top and the other remained at the bottom. The author suggests that in those instances in which the lung failed to float, there may have been some condition which rendered the lung-tissue more dense than the water.

Fibroids and Heart Disease.—Bleeding uterine fibroids may cause more or less acute anemia, but hemorrhage, as Brosin has shown, does not necessarily cause heart disease. In bleeding cancers it was found that the heart often remained remarkably strong. In any case of fibroid with cardiac symptoms, we must make allowance for, possibly, coincident heart disease, for medication, and also for bulkiness of the tumor embarrassing the circulation. Pressure on the ureters may indirectly affect the heart by causing renal disease. ALBAN DORAN (Brit. Jour. of Obstet., Jan., 1903), states that deaths which may occur suddenly after the removal of a fibroid of large proportions have occasionally been traced on post-mortem evidence to cardiac degeneration. It is known that the heart may fail on occasion, following the removal of any large tumor. To counteract the danger of heart failure sparteine answers in some cases where the kidneys are involved, but strychnine is universally acknowledged to be the best drug for this purpose. This latter, however is useless, if sepsis establishes itself. The practical value of considering the heart in relation to fibroids and hysterectomy, is that we are often called upon to distinguish shock, both from hemorrhage and sepsis. The author does think that it is well to attribute all bad pulse conditions to heart disease due to fibroids. After the removal of a large tumor a patient may have palpitations. Circulatory troubles are certainly observed in cases of fibroids where only moderate hemorrhagia or no bleeding at all exists. Syncope during the period (which was free though never severe) occurred in a case where the author removed a fibroid uterus. Pain must be taken

into account as well as free bleeding when the patient with fibrods has fainting fits during the period. It has been the author's experience that irregular pulses and attacks of syncope do not in themselves contraindicate operation, indeed, the patient is all the better for the removal of the tumor. Other forms of heart disease may complicate fibroids. The common valvular changes when compensation has failed, do not entail much extra danger, and the removal of a bulky fibroid, proves rather beneficial under the circumstances. On the other hand, chronic Bright's disease with dilated heart, greatly increases the risk of hysterectomy.

Carcinoma of the Cervix, Together with a Seven Months' Pregnancy.—A most interesting case of this description was treated by Cesarean section and extirpation of the uterus and the pelvic lymphatic glands by E. T. THRING (Brit. Jour. of Obstet., Jan., 1903). The child was viable and the disease had not advanced so far as to prevent the possibility of a radical operation with the hope of no recurrence. The operation is more severe on the patient than the vaginal one, but gives a better outlook for the future as far as a cure is concerned. The mortality in experienced hands, is but little greater than that of the vaginal one, provided only suitable cases are operated upon. Where the tissues beyond the pelvic lymphatic glands are infiltrated, and especially those around the ureters, the cases are unfit for the performance of a radical operation, with any hope of remote success. Other methods should be adopted. It would, the author thinks, be justifiable to remove a portion of the bladder if it were involved or doubtful. The principle of radical operation for cancer (and by that is meant not only the removal of the whole growth, and, if possible, the organ involved, but also the efferent lymphatics, and the nearest lymphatic glands which act as filters) is established, and will hold its ground until perhaps, the presence of a special cancer organism is demonstrated, and possibly in the future we may have an efficient serum treatment for cancer. For the present, however, we have to extirpate as widely and thoroughly as possible.

The Etiology of Dysmenorrhea.—Some cases of menstrual pain are cured by dilatation of the cervix, and others are not. It is plain that the former cases have at least one feature in common. The latter may be of the most diverse kind. Although this disease is most common, say G. E. HERMAN and H. R. ANDREWS (Brit. Jour. of Obstet., Jan., 1903) few text-book authors consider it of sufficient while to treat of it in their books. One theoretical statement as to the causation of dysmenorrhea, given by so many writers is that the uterus is anteflexed. Anteflexion is present in precisely the same proportion of women who menstruate without pain as in those women who have straight uteri. Sir J. Williams has reached the conclusion that the uterus is imperfectly developed, but that this does not retard the onset of menstruation. Primary, or dysmenorrhea, which starts with the onset of the puberty, is more likely to be cured by dilatation than that which is acquired. Especially is this true where the pain begins before the twenty-fifth year. Menstrual pain may be acquired at almost any time during the first half of menstrual life. The pain of menstruation may be of two kinds—general aching due to congestion of the pelvic organs which precedes menstruation, which is relieved by bleeding from the uterus, and the sharp uterine colic. The former is not relieved by dilatation, the latter is often cured by it. The pain of pelvic congestion not only begins earlier, but lasts longer than that of uterine spasm. Spasmodic pain does not permit the patient to lie down; pelvic congestion is relieved by quiet recumbrance. Spasmodic pain is severe and usually accompanied by nausea and vomiting. In most cases of dysmenorrhea there is no sign of organic disease of the uterus. The most obvious explanation of the cure of the menstrual pain by dilatation of the cervical canal is that the pain is caused by the narrowness of the canal. The cervical canal of a young multipara has never been seen so narrow as to prevent the flow of the menstrual blood. Such stenosis only exists in diagrams. The writers have come to the conclusion that the narrowness of the cervical canal is most often sufficient to account for a condition underlying and perhaps, causing the spasmodic dysmenorrhea, acting not by causing mechanical obstruction, but by preventing physiological dilatation. The treatment of these patients consists in the dilatation of the cervical canal by bougies.

Urethral Caruncle.—The results of considerable study concerning this painful malady are offered by M. LONGER (Zeitschr. f. Gerburtsh. u. Gyn., 1902, B. 48, H. L.) in the following terms: Caruncles in the female urethra are not true angiomata, but neoplasms of the mucous membrane, similar to granulations or hypervascular papillæ or polypi of the mucous membrane or telangiectatic type. Caruncles are distinguished from each of these three types of tumor not only by the structure, but also from tumors in this same region of the body by the constant presence of glands which frequently, through septic degeneration or interglandular bleeding or round-celled infiltration, are considerably altered. They are distinguished from the prolapse of the urethra not only by the microscopical condition, but also by the fact that on the surface they never have cylindrical or transitional epithelioma. The frequency of caruncles in adults is probably the same at any given age, but after fifty, they usually take the form of papillary polypi. Previous to the 40th year, one finds more frequently papilloma and telangiectatic polypi. As a cause, caruncles exist most frequently after the granulations, and the various atrophic changes due to age act on the polypi of the mucous membrane. For a very large number of cases, no direct cause may be assigned. The number of births appear to play no part in the origin of caruncles. The symptoms are usually due to a complicating chronic urethritis or to accompanying prolapse of the urethral mucous membrane.

Treatment of the After-coming Head.—The methods which have been devised for treating this condition are numerous, but the only two in practical use at present are the Smellie-Veit and the Martin. STEFFECK of Berlin (Deut. med. Woch., Jan. 15, 1903) thinks that the results, especially as regards the mortality of the child show the need of improvement. Trauma and asphyxia are not uncommon and their cause is traceable to the manipulations preceding the extraction of the head. He believes that the artificial introduction of the head into the pelvis is unnecessary, as a compressible body assumes of its own accord the shape and form best adapted to its passage through a narrow opening. The introduction of the finger of the operator into the child's mouth moreover is usually productive of premature respirations. The method advocated has been used with good results by the author in over 30 cases. He does not engage the head by traction on the child's body, but, as soon as the arms are free, he places both hands on the mother's abdomen, finds the fetal head and presses it downward and backward. This must be done slowly and at short intervals, the patient lying across and over the edge of the bed and the operator standing between her legs. The child is left to hang free. As soon as the head has fully entered the pelvis the Smellie-Veit method may be used to complete the procedure.

THE MEDICAL NEWS.

A WEEKLY JOURNAL

OF MEDICAL SCIENCE.

COMMUNICATIONS in the form of Scientific Articles, Clinical Memoranda, Correspondence or News Items of interest to the profession are invited from all parts of the world. Reprints to the number of 250 of original articles contributed exclusively to the MEDICAL NEWS will be furnished without charge if the request therefor accompanies the manuscript. When necessary to elucidate the text illustrations will be engraved from drawings or photographs furnished by the author. Manuscript should be typewritten.

SMITH ELY JELLIFFE, A.M., M.D., Ph.D., Editor,
No. 111 FIFTH AVENUE, NEW YORK.

Subscription Price, including postage in U. S. and Canada.

PER ANNUM IN ADVANCE	$4.00
SINGLE COPIES	.10
WITH THE AMERICAN JOURNAL OF THE MEDICAL SCIENCES, PER ANNUM	8.00

Subscriptions may begin at any date. The safest mode of remittance is by bank check or postal money order, drawn to the order of the undersigned. When neither is accessible, remittances may be made, at the risk of the publishers, by forwarding in *registered* letters.

LEA BROTHERS & CO.,
No. 111 FIFTH AVENUE (corner of 18th St.), NEW YORK.

SATURDAY, MARCH 7, 1903.

HIP JOINTS AT HOME AND ABROAD.

SOME fifty-years ago, when Sayre had done more than forty cases of excision of the head of the femur, he said that although there seemed a bright outlook for the operation, its period of usefulness would be short. His prophetic eye saw into the future with a clearness that was characteristic of the man. Whereas thirty years ago excision of the hip was a common operation in this city, relatively speaking, to-day it is equally rare.

Even in staid surgery fashions come and fashions go. In 1846, just about the time that Sayre was beginning his series, Pancoast wrote "notwithstanding the common fatality attending the ordinary treatment of coxalgia *with caries of the head of the bone*, there seems as yet little or no reason to believe that the chances of the patient would be improved by resorting to so severe an operation . . . the patients in the greater number of cases dying in consequence of the extension of the caries, the violence of the consecutive inflammation, or of the exhaustion produced from excessive suppuration." History repeats itself. In 1903 we read, Bradford and Lovett, "The risk from death arising from general tuberculosis and tuberculous meningitis in cases of hip diseases treated conservatively, is very small: about six per cent. After operation, on the other hand, in addition to the small mortality from the direct shock of this operation there arises a death rate, according to some authors, of almost fifty per cent. from secondary tuberculous involvement. The hope of immunity from tuberculous infection has not been gained by resection."

Apparently we have passed the milestone; we are now sufficiently advanced, in this country, to recognize coxitis in its early stages, to give it suitable protection that time may work the cure; Sayre's prophecy has been fulfilled.

So much for ourselves and our attitude toward this disease. How about the rest of the world? It is then with a feeling more akin to pity than anger that we scan the pages of a voluminous article in a recent number of the *Zeitschrift für Chirurgie*, and struggle through histories of forty-four resections! The author evidently feels that he has entered an untrodden field, and the general trend of the article is cut! cut!! cut!!! Cut the child from the hip, as though the disease were malignant; dynamite out the acetabulum, if need be; hoe out the shaft of the femur and epiphysis if necessary—it's a sort of "ad majorem Dei gloriam" job to be relished by all. This odd man admits a mortality in pus-free cases of 16.5 per cent. and 48.8 per cent. in that vast majority where it is present. How anyone not the victim of fixed delusions can urge these monstrous figures on the public passes wonder! Here, however, is the explanation—read his wretched bibliography—out of a total of fifty authors cited from only ONE writes in English, and he is well known to be a rabid advocate of excision. It may be well for the German surgeon to pause before he further decimates and maims the young generation, to read what we can tell him. Despite the greatness of the empire these children *might* be useful.

NEPHRECTOMY FOR MALIGNANT TUMOR.

NEPHRECTOMY for malignant tumor is not one of those life-saving operations which the surgeon can undertake with an easy confidence born of success, and which tend to create in the lay mind an attitude of respect for modern surgical skill and power. Its successes are relatively few, yet a study of the published results reveals two comforting facts, namely, a gradual diminution in the percentage of deaths occurring during operation, and an increasing percentage of cures.

The statistics of nephrectomy in cases of malig-

nant tumor have been collected and published in succession by Guillet (1888), Siegrist (1889), Chevallier (1891), Küster (1897), Albarran and Imbert (1902). Prof. Forgue in a recent report to the Association Française d'Urologie, joined to a study of these statistics an analysis of the results of nephrectomy in the services of Czerny, Krönlein, König, Trendelenburg, Riedel, Israel, Albarran and Tuffier. The inferences drawn from these studies are that nephrectomy in cases of malignant tumor gives better results to-day than in the earlier days of the operation because rigorous asepsis has been substituted for antisepsis (the latter involving the use of toxic agents which damaged the remaining kidney), because the operative technic has improved, and because futile operations on tumors too adherent are no longer undertaken.

Assuming that the term cure should only be used in cases in which the patient lives at least four years after the operation, Forgue finds that in 400 cases of nephrectomy for malignant tumor 28 cures were effected. Against these 28 cures must be counted the large number of cases in which operation is followed by a rapid extension of the malignant growth, and furthermore, the fact that tumors of the kidney, left to themselves, often pursue a slow course. The beneficent possibilities of nephrectomy will not fully be realized until, to the improvements already noted, there shall have been added an improvement in diagnosis, for it is to this that renal surgery must henceforth look for the opportunity to perform timely operations and to effect a larger proportion of cures.

Hematuria is the signal symptom in renal tumor. If it co-exist with a palpable growth, the diagnosis is relatively simple. At times a renal tumor develops insidiously, painlessly, without hematuria, and is first recognized when it becomes palpable or visible below the free border of the ribs; in such cases the prognosis is not favorable, because it is probable that the visible or palpable mobile growth represents but a fraction of the whole, while the great bulk of the neoplasm occupies the sub-diaphragmatic vault and is surrounded by adhesions. If hematuria be present and no tumor can be felt, the diagnostic difficulty is great; but the cases diagnosed under these conditions are precisely the ones which offer the greatest reward to surgical intervention. Hematuria, therefore, is never to be regarded lightly; its source should be established as speedily as possible, and if the hypothesis of renal neoplasm can be reasonably established, there should be no hesitancy in resorting to lumbar incision and renal exploration after determining, by vesical segregation or ureteral catheterization, from which side the hemorrhage proceeds. Contraindication to operation are massive adhesions to perirenal tissues, extended involvement of lymphatic nodes, presence of metastatic growths, bilateral renal cancer, insufficiency of the kidney not involved in the malignant growth, and the usual contraindications to any grave operation, based upon the general state of the patient or the condition of vital organs.

SPRING CLEANING.

IT is commonly believed among good housewives that the first week in March is a fitting time to anticipate the possible arrival of certain migratory pests. The traditional house-cleaning fever that stirs the blood of these worthy dames about the time that the sap begins to run has made itself felt with us, and we present to our readers this week some sage advice concerning preventive measures to avoid malaria by the extermination of mosquitoes.

The men who have contributed to our mosquito-malaria symposium advocate a thorough cleaning up of all breeding places of mosquitoes and a disposal of garbage and an utter routing of empty cans and barrels and anything that might hold water; in short, they advise, if we would avoid malaria, a very much neater and tidier way of living than the city had ever deemed necessary, especially in the poor suburban districts.

The Board of Health is doing its part in the propaganda and the real estate agent is deciding how much he can spend on kerosene and drainage to boom his lots, but the physician is the one who can do more to infuse the general spirit of spring cleaning into the community than any other man. As a topic of general conversation he should introduce the subject of mosquitoes and malaria wherever he goes. It is a light and easy matter to approach, being available through the introduction of summer vacations, suburban residences, and the never-failing topic of the New York Tunnel; but he should never leave it lightly, for he has the power to impart knowledge and to create a sentiment that will make a vast difference in the health and wealth of American citizens.

It is strange that with all our empirical knowl-

edge of malaria, the dangers of being out after dark on summer nights, of living near marshes, or newly broken ground, of sleeping out of doors, that we should never have suspected that the teasing mosquito, omnipresent under such conditions, should be the cause of the greater trouble.

We are not so clever as we have commonly supposed ourselves to be. Indeed, a hill tribe of Africans showed more wit in their limited observations than scientists from Aristotle down. They noted that when they went down to the plains they were bitten by mosquitoes which they called *Mbu*, and with the bites came the sickness which they also called *Mbu*, the sickness being no other than malaria.

Now that the marvelous relation of the malarial plasmodium to its winged host is worked out, we hope that the American people will take upon themselves regularly the spring-time task of cleaning up their mosquito-breeding lands.

THE PROPOSED PSYCHOPATHIC HOSPITAL.

IT is to be hoped that the bill now pending in the legislature of this State, appropriating $300,000 for a new hospital for the insane, will meet with the approval of that body. The measure presented by the State Commission in Lunacy provides for the erection of a suitable building where patients may be cared for until examination proves or disproves the soundness of their mental condition.

Strange to say, with 24,000 persons adjudged insane in the State of New York, there has never been a place especially provided where suspects might be kept under restraint until such time as removal to Ward's Island, or other institution, became necessary. In this city the wards of Bellevue Hospital have in part served such purpose, but conditions there are becoming quite inadequate to cope with the increasing number of cases.

A properly fitted institution would furnish very suitable and efficient means for the isolation of diseases of the mind and nervous system, and would offer to recent graduates in medicine an opportunity to study the same, which practice could be gained in no other place.

With the tremendous effort the people of this country are making to keep pace with growing activity in business, and with the increasing struggle for existence, there seems to be good reason for supposing that insanity is on the increase, and therefore demands our best effort in its amelioration. The prosecution of such an object, however, can scarcely be carried on unless the work of the physician be supplemented by the setting apart of public money, according to the plan outlined in the proposed legislation.

ECHOES AND NEWS.

NEW YORK.

Columbus Hospital, New York.—The following appointments were made at the meeting of the Medical Board of the Columbus Hospital held on February 2. Dr. Frank Farquhar Ferguson was transferred from visiting to consulting physician to the hospital; Dr. Frederick C. Keller, Assistant Attending Physician, was appointed Attending Physician, and Dr. Henry Hazen was appointed Attending Physician in Children's Diseases.

Columbia Appointments and Changes.—The trustees of Columbia University decided yesterday to place the new department of physical education under the administration of one department, of which Prof. Thomas D. Wood is to be the head, with a seat in the faculty of Teachers' College. The university gymnasium will be in charge after July 1 of Dr. George L. Meylan of Boston as adjunct professor of physical education. The office of Medical Visitor was created, and Dr. D. S. D. Jessup of No. 305 West Eightieth Street, a member of the staff of instruction at the University Medical School, was appointed to it. Dr. George L. Peabody, Professor of Materia Medica and Therapeutics resigned, to take effect at the close of the academic year. Dr. Livingston Farrand, Adjunct Professor of Psychology, was made Professor of Anthropology; Charles A. Strong was appointed Professor of Psychology.

Polyclinic Appointments.—At a recent meeting of the Faculty of the N. Y. Polyclinic Medical School and Hospital, Dr. Charles Gilmore Kerley was elected Professor of Pediatrics, and Dr. J. A. Bodine, Professor of Surgery.

The Situation at Ithaca.—A recent election on the question of municipal control of the waterworks of Ithaca resulted in an overwhelming victory for city ownership, there being 1,335 votes in the affirmative and only 30 in the negative. It is estimated to-day that there are in Ithaca six hundred persons who are suffering with typhoid fever, and probably two hundred others elsewhere who have contracted the disease here. Nineteen Cornell students have so far died of typhoid fever, of whom eighteen were male students. This is almost one per cent. of the male students in Cornell. The condition of the patients in the Cornell infirmary is reported to be better than on any day since the epidemic began. The Health Board of Ithaca has inaugurated a system of district nursing of the ill.

Appointment of Drs. Thatcher and Bovaird.—Dr. D. Bovaird has been appointed Assistant Visiting Physician to Presbyterian Hospital. Dr. J. B. Thatcher taking the visiting appointment made vacant by the retirement of Dr. A. H. Smith.

Nurses Desert a Hospital.—Failing in their efforts to have their new superintendent removed, the expert trained nurses of the New York Eye and Ear Infirmary left the institution in a body last Monday.

Summer Course College of Physicians and Surgeons.—Columbia University will establish in the summer of 1903 an extensive series of courses in medicine for men for the benefit of practising physicians who desire opportunities for additional study and investigation, as well as for that of properly qualified students of medicine and surgery. The instruction

in each course will be thoroughly practical in character, and the number of students to be accepted in any given course will be strictly limited in order that each one may gain the fullest possible benefit.

Instruction will begin on Monday, June 1, (with the exception of one course in obstetrics, beginning May 11), and continue until Monday, August 24. The several courses will vary from three to six weeks in length. Students will be registered for any given course or courses in the order of their application, in case the application is accompanied by one-half the amount of the proper fee. Before May 1, 1903, any application may be withdrawn, in which case the advance payment will be returned. After May 1, 1903, advance payments made by those for whom places have been reserved, will not be returned in any case. Practising physicians may register for any course or courses that they select. Students of medicine will only be permitted to register for those courses which their standing in the College of Physicians and Surgeons, or in some other medical school of equivalent rank, would permit them to take. Regular students in the College of Physicians and Surgeons, who, being eligible to enter any practical course or courses offered at the Summer Session, satisfactorily complete such course or courses, will be exempted from attendance upon equivalent courses given during the regular academic year. These summer courses will be Neurology, Gynecology, Ophthalmology, Dermatology, General Medicine, Pediatrics, Diseases of Stomach and Intestines, Genito-Urinary Diseases, Otology, Obstetrics, and Laryngology.

PHILADELPHIA.

Dr. S. Weir Mitchell Dined by University Club.—The Board of Governors of the University Club tendered a reception and dinner to Dr. S. Weir Mitchell on Friday evening, February 27. The following is quoted from a brief speech made during the evening by Dr. Mitchell: "Perhaps I am better known to you by my literary work than by my works of science. I will say, however, that if I should be by necessity compelled to give up any branch of my work I would discard the literary work. I would rather be known for what I have done in my profession, medicine, than by my writings."

College of Physicians Fund Raised.—It is announced that the $50,000 necessary to secure a like amount from Andrew Carnegie has been secured by the College of Physicians of Philadelphia. It has not yet been finally decided whether the contemplated improvement will consist in making higher the old building or in purchasing a new site and erecting a building thereon. The latter project will probably require an additional $100,000.

Use of the Widal Test Requested.—The prevailing epidemic of typhoid fever is given as the reason by the health authorities for sending out a circular asking physicians to use the Widal test to facilitate diagnosis of that disease. The test is made by the city free of charge. The request is made not only to aid in diagnosis but to assist the department in gathering correct statistics relative to disease.

Sand Filtration Has Proven Successful.—The five beds at the Lower Roxborough filter station of the city water supply have been running continuously during the past three weeks, and according to Engineer Hill have more than met expectations regarding them. It has been contended that the system would not operate when the thermometer ranged between 2 and 20 degrees above zero. During the three weeks' test the temperature went at different times as low as two degrees above, yet at no time was there difficulty regarding the delivery of water from any of the five beds. Results as to turbidity and bacteria were very satisfactory.

City Officials Enjoined from Purchasing Vaccine Privately.—One of the most important suits involving the subject of vaccination was begun in Court of Common Pleas No. 1 recently by counsel for Jacob Damback. The suit is an equity proceeding against the municipal authorities, the respondents being Director English, Chief Good, of the Board of Health, and Controller Walton. Damback asks to have them enjoined from purchasing the city's supply of vaccine virus privately. He contends that the vaccine should be bought by contract after the city's wants have been regularly advertised and the different manufacturers of the vaccine given an opportunity to present their bids with an analytical description of the component parts of their product. Under the present system, it is averred, all the city's supply of vaccine virus is purchased privately from a company in $100 lots, in compliance with the pretended authority of an ordinance of Councils, but it is contended that the ordinance is in violation of the law passed by the State legislature on May 23, 1847, which requires that all work and supplies to be furnished to the city shall be done by contract.

Banquet of ex-Resident Physicians of University.—Fifty former resident physicians of the Hospital of the University of Pennsylvania held their second annual dinner at the University Club Saturday evening, February 28. Dr. Barton Cooke Hirst responded to the toast, "The Old Hospital and the New." Dr. William E. Hughes dwelt on "The Golden Days," when those present were resident physicians. Dr. Charles H. Frazier, Dean of the Medical School, recalled "Old Members of the Staff," while Dr. Edward Martin told of "Some Wild Residents I Have Known." Dr. John Carpenter discussed "The ex-Resident as a Specialist." The officers chosen were: President, Dr. George E. de Schweinitz; Vice-Presidents, Dr. Penn Gaskill Skillern, Dr. Edward Martin, Dr. W. E. Hughes, and Dr. John H. Jopson; Secretary-Treasurer, Dr. Albert P. Francine.

Ulcerative Endocarditis of Long Duration.—This interesting case was reported at the Philadelphia Pathological Society February 26 by Dr. David Riesman. The patient was a white male, laborer, aged thirty-one years. He had served in the Spanish-American War and gave a history of having had yellow fever, typhoid fever with two relapses, chronic malaria, and fracture of an arm and leg. For three months while in the army he suffered with irregular fever and chills accompanied by pain in the eyeballs, photophobia, vomiting and diarrhea. Since that time he had a similar attack each fall and spring, each lasting about three months and causing practically the same symptoms. Each was preceded by a peculiar buoyancy or feeling of well-being which came to be recognized as an aura preceding the attacks. In September, 1902, the patient had his last attack and was soon after admitted to the Philadelphia Hospital. Examination was fairly negative except for a distinct cooing heart murmur. This murmur ceased a short time before the patient's death, which occurred early in January, 1903. Autopsy revealed large vegetations on the aortic valves and two perforations of the leaflets, one being a very large one. There were multiple infarcts of the spleen, but no involvement of other organs. The larger opening in the valve leaflet was closed by a recent fibrinous clot which undoubtedly had caused the disappearance of the murmur. An interesting point in this case was its duration—from September to January. Dr. Riesman has seen ten cases of malignant en-

docarditis of which two recovered. The longest duration was six months.

Diseases of the Biliary Passages.—Dr. John B. Deaver, as the guest of the James C. Wilson Medical Society, addressed the students of the Jefferson College on the above topic February 24. The anatomy of the structures in question was considered in detail and the indications for medical and surgical treatment of diseases of the passage pointed out. Surgical interference is demanded in most acute infections except catarrhal jaundice, and cholecystitis without jaundice or where there is rapidly diminishing tenderness. In cases of cholelithiasis the indication for medical treatment is acute obstruction of the common duct, the treatment being morphine, rest and hot applications followed by intestinal antiseptics, bathing, etc. Other cases demand surgical treatment. Dr. Deaver gives calcium chloride in 20 or 30-grain doses four times daily a few days before operation, and 60 grains by rectum after operating in all cases as a routine practice, although he is not positive that it does any good in the way of guarding against hemorrhage. For post-operative oozing, opium is of more value than calcium chloride. Dr. Deaver closed by urging physicians to study more living pathology, by which he means the observation of symptoms and then standing by the surgeon and actually viewing the conditions found at operation.

CHICAGO.

General Increase of Sickness.—Practising physicians report a general increase of sickness throughout the city, although the prevailing diseases, especially bronchitis, influenza and pneumonia, are not of a very severe type. Influenza is practically epidemic, but the deaths from this malady are not so numerous as they were a year ago, when the number of cases was much fewer.

Suicides.—There have been 50 per cent. more suicides and 16.8 per cent. more other violent deaths this year. Only the deaths from infantile convulsions (16 per cent. less), diphtheria (13.6 per cent. less), scarlet fever (30 per cent. less), and influenza (35.4 per cent. less), are fewer this year than last.

The Fly as a Carrier of Typhoid.—Dr. Alice Hamilton read a paper on this subject before a meeting of the Chicago Medical Society. She has made an exhaustive inquiry into the part played by the common house-fly in the recent epidemic of typhoid fever in Chicago. Most of her work was done in the laboratory of the Memorial Institute for Infectious Diseases. She reaches the following conclusions: (1) The epidemic of typhoid fever in Chicago during July, August, September and October, of 1902, was most severe in the Nineteenth Ward, which, with one-thirty-sixth of the city's population, had over one-seventh of all the deaths from this disease. (2) The concentration of the epidemic in this locality cannot be explained by contamination of the drinking water, or of food, or on the ground of ignorance and poverty of the inhabitants, for the Nineteenth Ward does not differ in these respects from several other parts of the city. (3) An investigation of the sanitary conditions of this region shows that many of the street sewers are too small, and that only 48 per cent. of the houses have sanitary plumbing. Of the remaining 52 per cent., 7 per cent. have defective plumbing, 22 per cent. water closets with intermittent water supply, 11 per cent. have privies connected with the sewer, but without water supply, and 12 per cent. have privies with no sewer connection. (4) The streets in which the sanitary arrangements are worst had the largest number of cases of typhoid fever during this epidemic, irrespective of the poverty of the inhabitants. (5) Flies caught in two undrained privies, on the fences of two yards, on the walls of two houses, and in the room of a typhoid patient were used to inoculate eighteen tubes, and from five of these tubes the typhoid bacillus was isolated. (6) When the discharges from typhoid patients are left exposed in privies or yards, flies may be an important agent in the dissemination of the typhoid infection.

Meeting of the Board of Trustees of the American Medical Association.—The Board of Trustees of the American Medical Association held a meeting in this city several days ago, and, according to the Journal of the Association, Dr. J. N. MacCormack, of Bowling Green, Kentucky, has been asked by the Board to devote his whole time to the work of organization as the representative in this work of the American Medical Association. Dr. MacCormack has accepted the position, and will immediately enter on his duties. It is expected that he will spend much of his time in the field, and will be at the command of such State societies as may think his services can be made useful to them.

The Illegitimate Child in Chicago.—Mr. Hastings H. Hart read a paper on this subject before the Chicago Medical Society, Feb. 18, and among other things, he said that Chicago is the great dumping-ground for the social wreckage of the interior. There is no city in the Union which suffers as much as Chicago in bearing the burdens that belong to other communities. The physician more than any other public servant, he says, is the guardian of the morals of the community. His relation to his patient is such that he is able to exercise a potent influence at the time when it is most needed. Many a young woman has been rescued from dire peril and has become a good wife and mother through the wise and timely intervention of a faithful physician. He said that four parties are to be considered: The child, the mother, the father and the community, including relatives and friends. It is the duty of the physician to see that the child's life and health are properly guarded before and after birth. It is his duty to throw the whole weight of his influence, personal and professional, against the commission of the crime to destroy the life of the child before birth. If the mother is physically capable, she should invariably be required to nurse her child. The second party to be considered by the physician is the young mother. Most physicians stand ready to furnish their professional services without recompense, and to see that she has proper physical care as long as she is in the physician's hands. As to the third party, it is almost a universal rule that while the father of the child is the chief offender, he suffers least of all. Under the laws of Illinois, the father may be compelled, if able to make provision, up to the sum of $550.00; but in practice comparatively few fathers are made accountable. The mother is deterred from taking legal steps, sometimes on account of affection for the father, more often on account of her unwillingness to subject her own name and that of her family to the ignominy which attends bastardy proceedings. Mr. Hart then considered the fourth party, namely, the community, including the parents and friends of the offenders, the multitudes of young people who are exposed to like temptation, and the charitable public. Every increase of faithful, conscientious and intelligent treatment of this subject on the part of those who stand in the position of guardians of the public morals, tends to diminish the heavy burdens which rest upon the good people of the community, and toward the uplifting and purification of the body politic.

GENERAL.

Course in Bacteriology.—A post-graduate course in Bacteriology and Bacteriological Diagnosis will be

given at the College of Physicians and Surgeons, Baltimore, Md., beginning May 1, 1903, by Dr. Leonard K. Hirshberg, A.B., M.D., of Johns Hopkins University.

Offer of Hospital Site.—Dr. Walter B. Platt of Baltimore has written to the Commissioners of the District of Columbia tendering them, in the name of a lady, a piece of property to be used for maintaining a children's hospital for Washington. The Commissioners have replied acknowledging the receipt of the letter and saying that they will take the matter under consideration.

New Hospital at Cambridge, Md.—The plans and specifications for the new Cambridge Hospital to be built at Cambridge, Md., have been completed, and members of the building committee are having estimates of the cost prepared by a builder at Cambridge to whom the contract will probably be awarded. Mr. John E. Hurst, head of the firm of John E. Hurst & Co., Baltimore, a native of Dorchester county, has agreed to contribute $15,000 of the $40,000 required to purchase the site and erect the hospital. The State has appropriated $5,000 and the town of Cambridge $5,000. Mr. Hurst is taking a deep interest in the selection of the site and preparation of the plans. It is practically settled that the site will be in East Cambridge on a bluff that is the highest point in the town, commanding a view for miles up and down the Choptank river.

New Buildings for the University Hospital (Columbian), Washington.—Since the reconstruction of the old hospital building and the addition thereto of the extensive new structure just completed, the institution is now provided with private rooms, newly and comfortably furnished, with all modern improvements, some of them with private bath-rooms, arranged en suite, and with open fireplaces. Elevators, sun parlors, a roof garden, and the best arrangements for ventilation, heat, and for every home comfort and convenience have been provided. In the original building arrangements have been made for a Maternity Service, and in the new structure, besides the private rooms, wards for medical and surgical cases are now ready. Three operating-rooms, fully equipped with modern aseptic and antiseptic appliances, and rooms for a Dispensary Service, have also been supplied, including a complete sixteen-plate Bowen X-ray apparatus. The new building for the Medical and Dental Schools is five stories high, with four large lecture halls, each seating from 200 to 350 students; large laboratories for chemistry, pharmacy, histology, physiology, bacteriology, pathology, and anatomy; recitation-rooms, professors' rooms, museum, library, reading-room, and study-rooms. The Dental Infirmary rooms, with good southern light, modern chairs, and every facility for operative and prosthetic work, are unexcelled. The central location of the hospital and the readiness with which it can be visited by members of the medical staff in case of need are especially desirable.

Obituary.—Dr. W. E. B. Davis, of Alabama, was killed Feb. 24 by being thrown from his horse and then run over by a moving train. Dr. Davis was thirty-nine years old. He was born in Trussville, Ala., and came of a line of physicians. He graduated at the University of Alabama, studied at Bellevue in New York, was in Europe for two years and practised in Birmingham, Ala. Dr. Davis was one of the rising young men of the South and his loss is a severe one.

Dr. Harry Gifford, formerly a surgeon in the United States army and lately surgeon of the Vandalia railroad, was found dead at Richmond, Ind., Tuesday, of heart trouble.

Dr. Henry W. Richter, prominent among physicians of Brooklyn, died Tuesday at his home, No. 620 Carlton avenue, in his sixty-fifth year. For nearly thirty years he had practised in Brooklyn and his father had been a physician in Brooklyn before him. The cause of death was general debility.

Dr. Charles H. Ohr died in Cumberland, Md., Tuesday, in his ninety-third year. He was born at Funkstown, Md., was educated at a private academy, and received his diploma from the University of Maryland in March, 1834. In the cholera epidemic of 1853 he introduced the use of strychnine, and, despite the great mortality of the time, he lost only 113 out of 600 cases. He wrote many books on medicine and was president of the Maryland Medical and Chirurgical Faculty in 1872. Dr. Ohr was for ten years consulting physician to the Cumberland Board of Health, was a member of the City Council three terms, Mayor of Cumberland from 1859 to 1866, when he was also surgeon at the Federal Hospital here, and was State Senator from 1864 to 1867.

OBITUARY.

T. GAILLARD THOMAS, M.D.

IT was Dr. T. Gaillard Thomas who said "The older I grow in medicine, the stronger becomes the conviction that the medical profession exemplifies that 'great heart of the Saviour of the world.'" Dr. Thomas has lived his years and it is the conviction of all who knew him that his own life was a model of the highest type of manly vigor, of Christian sympathy and of professional skill.

His sudden death on February 28, at his winter home, in Thomasville, Ga.; was a shock to all who believed his health to be unimpaired. Although he was in his seventy-second year, he was a man young in spirit and in vigor, and it was not thought possible that the attack of grip, from the effects of which he went South to recover, would prove fatal.

Dr. Thomas impersonated the culture of generations flowering in the ardent personality of a genius. He came of a well-known family in South Carolina. His father was the Reverend Edward Thomas, the descendent of an English forebear sent by the Church of England to South Carolina, while his mother, Jane Marshall Gaillard was the daughter of Judge Gaillard of the Supreme Court of South Carolina, who was of old Huguenot blood.

Dr. Thomas was born in 1831 and received his education in the Medical College of Charleston from which he graduated in 1852. Although his education was received in the days when a good manner and friendship with the faculty were chiefly essential to a medical degree, Dr. Thomas, nevertheless, was able to come unfriended to New York and carry off the honors from New York men in a competitive examination at Bellevue where he spent some time as resident physician.

After spending a year and a half visiting different European hospitals he returned to New York where for half a century he was a leader in medical thought. He grasped the great ideas that were revolutionizing medical science, such as Virchow laid down in his science of Cellular Pathology, and was one of the foremost men to build up on them the vast structure of modern medicine in this country.

Throughout his life he has been a teacher as well as a physician. It was in 1855 that he began his work in New York. He soon organized a quiz class, the second of its kind in the city where he first showed his remarkable capacity as a teacher. From his success in this line Dr. Thomas was made adjunct lecturer in

the University, and later physician to Bellevue Hospital where he was one of the first to bring about real advances in the science of exact diagnosis. The keynote of his success was direct observation, and throughout his life he retained the warmest enthusiasm for bed-side work, with ability to impart his methods and enthusiasm to others. Physicians who called him in consultation, and he was one on whom many relied, were often surprised at the quickness and sureness of his diagnosis, which was the result of long and varied experience.

Among his earliest friends was the late Dr. Metcalfe who took him into partnership and who introduced him to a large clientele which Dr. Thomas, by his charming manners and courtesy as well as by his skill and keen attention to his profession was well able to hold.

In 1863 he was made Professor of Obstetrics in the

T. GAILLARD THOMAS, M.D.

College of Physicians and Surgeons, and later became Professor of Gynecology in the same college. Dr. Thomas preferred surgery to medicine and in 1868 withdrew from general practice that he might devote himself more exclusively to his gynecological work. He resigned the position of visiting surgeon to Bellevue which he had held for fifteen years and became a surgeon of the Woman's Hospital. He was also connected at various times with St. Luke's, Roosevelt, the French, and Nursing and Child's Hospitals.

The result of his experience in his chosen branch of the profession he contributed freely to medical journals and also incorporated it in a work on gynecology which has passed through six editions and of which 60,000 copies have been sold. It has also been translated into seven languages.

The original work that Dr. Thomas did in gynecology, the methods of operating that he devised and taught, and the practical applications of science to practise such as the device of the incubator for the prematurely born all placed him in the position of a leader and it is safe to say that he did more to mold the ideas of his generation in gynecology than any other man in this country.

Dr. Thomas was a man whose talent for friendships amounted to an art. On the occasion of his seventieth birthday, some three hundred representative physicians of the country met to do him honor and on that occasion he spoke himself in love and praise of the group of distinguished men who had been his friends and who had passed away; while his living friends, men who stand first in the ranks as physicians, toasted him with words of friendship and regard.

Dr. McLane said of him "Dr. Thomas has learned that precious art of knowing how to live, and his high sense of honor and integrity has won for him the highest esteem."

The Rev. Dr. Greer said "To meet and find a *man*, was it not the greatest of all human charms? for back of all professions and all successes, whatever the field his was the charm of the *man*."

Dr. Weir Mitchell spoke of him as "a friend, intelligent and noble." Dr. Welch said "There are many to call him master. He has numberless friends and admirers, and his colleagues appreciate the lovable character of the man who has the best and the highest ideals."

Though one may cull the spoken words of friendship from those who could appreciate him professionally, it is impossible to gather any expression of the feelings of love and gratitude that he has inspired in the hearts of his patients. Through fifty years of active work he has continually relieved suffering and given his patients the confidence of returning health; and more, he has worked out new methods by which relief has been given to multitudes who knew him only in name.

No brighter crown need be awarded to a man at the end of a long and useful life than the consciousness of having left the world better than he found it and the knowledge that his friends hold him noble and generous, and dear.

CORRESPONDENCE.

TRANSACTIONS OF FOREIGN SOCIETIES.

French.

POINTS IN INFANT FEEDING—SYPHILITIC ENDARTERITIS AND NEPHRITIS IN AN INFANT—PARALYSIS OF THE CERVICAL SYMPATHETIC ON ONE SIDE, FOLLOWING EVACUATION OF A RETROPHARYNGEAL ABSCESS BY HILTON'S METHOD—INFANT SUFFERING FROM UNUSUAL KIND OF MICROCEPHALY—MECHANISM OF LARGE INTESTINE—DITA BARK AND AUSTRALIAN BITTER BARK—PAIN—HEART OF MAN AGED FORTY-SEVEN YEARS—SURGICAL TREATMENT OF GASTRIC AND DUODENAL ULCERS.

During the past month the meetings of the scientific and medical Societies in Great Britain have been rich in interesting material, from which the following has been culled for the benefit of our readers:

C. C. DOUGLAS, at a meeting of the Glasgow Obstetrical and Gynecological Society, Jan. 28, 1903, read a paper on some points in infant feeding. While recommending maternal nursing as the best, he pointed out that in certain cases where the child did not thrive an analysis of the milk might indicate the error. He had found in some cases a reduction of the percentage of fat and in others a diminution in the sugar or an increase in the amount of proteid gave the best results. Cow's milk used without dilution was not recommended

as a routine, but a dilution to one to three without the addition of cream or sugar (preferably lactose) was too much. The speaker pointed out how the reduction in the fats might interfere with the absorption of the lime salts (as lime soaps) and might thus have some bearing on the etiology of rickets. For the infant fed on cow's milk the milk ought to be pasteurized and absolutely free from preservatives.

G. E. SOUTHERLAND and J. W. THOMSON WALKER, at a meeting of the Society for the Study of Disease in Children, Jan. 16, 1903, contributed a paper on a case of syphilitic endarteritis and nephritis in an infant. The child presented evidences of congenital syphilis and there was paralysis, and later rigidity of the right arm, the lower extremities also becoming rigid and the head retracted. Albumin was present in the urine. At the necropsy there was endarteritis of the cerebral arteries and softening of the left frontal lobe of the brain. The kidneys showed diffuse interstitial nephritis. A second case of interstitial nephritis due to congenital syphilis was also described. Dr. Southerland and Mr. Walker considered that the most important change in this form of arteritis took place in the adventitia and that syphilitic arteritis was a secondary and not a tertiary manifestation of the disease. The etiology of nephritis in children was often obscure and the importance of syphilis as a cause was greater than was often supposed. Many of these cases were probably unrecognized, owing to the slight naked-eye changes.

SYDNEY STEPHENSON, at the same society, described a case in which paralysis of the cervical sympathetic on one side had closely followed the evacuation of a retropharyngeal abscess by Hilton's method. The symptoms were characteristic and included ptosis, contraction of the pupil, enophthalmosis and lowered intra-ocular tension. No change in the state of the blood vessels or the function of sweating were noted.

Dr. Guthrie showed an infant, aged five months, suffering from an unusual kind of microcephaly. The occipital bone showed a bean-like projection, and overlapped the two parietal bones. There was in addition spasticity of all the limbs. The child's features did not suggest imbecility.

R. W. LEFTWICH, at a meeting of the Brixton Medical Society, held Jan. 29, 1903, read a paper on the mechanism of the large intestine. He pointed out that the structural peculiarities of the colon were all adverse to the view that peristalsis there was the one propelling force. The large lumen, the weak muscular development, the sacculation of the walls, the fixation and the upward force of the ascending colon, all presented obstacles. In cases of orthopnea a stream had to be forced against gravitation for months together without the help of valves, and yet constipation was not a special feature of the condition. Dr. Leftwich then proceeded to demonstrate that there were two other forces at work. The course of the large intestine suggested a syphon, its short ascending limb, starting from the right iliac fossa, being the ascending colon, and the long descending limb, terminating at the anus, being the descending colon and rectum. There was therefore always a fixed fecal column in the colon, the cecum being usually empty. After defecation a stream propelled by peristalsis of the small intestine filled the cecum, and, on reaching the fecal column, pushed this forward and disturbed the balance; syphonage was then set up; the cecum was emptied and the rectum was filled. The necessary rigidity of the walls of the colon was obtained by a tonic contraction of the longitudinal bands which also deepened and thickened the dissepiments between the saccules. The existence of this tonus was shown by the deep retraction of the anus, the longitudinal fibers of the rectum being continuous with those of the bands; by the maintenance of the transverse colon in situ without waviness, notwithstanding that it was twice as long as its bed; and by the elongation of the colon which took place in sigmoid obstruction. The tension upon the bands and the unequal distribution of gas and solids in this condition accounted for the movements which had been mistaken for peristalsis. The saccular undulations described by Boas must be quite ineffective for propulsion and were connected with absorption only. Further, the cecum presented a good example of the hydrostatic paradox. It had a small feed pipe, the ileum, and a piston of much larger sectional area in the fecal column of the ascending colon, the whole forming a kind of hydraulic lift, the gain being equal to about ten times in the ascending colon and twice in the sigmoid flexure. It was just where this power reached its minimum that syphonage came to the rescue. Dr. Leftwich showed experimentally that syphonage set up a vacuum in the cecum, the ileocecal opening being blocked probably by a sucking through of the mucous membrane of the ileum like an incipient intussusception, for which lesion a good explanation was thus offered. The formation of a vacuum might have a highly beneficial effect in evacuating the appendix.

J. GORDON SHARP, at a meeting of the Therapeutical Society, held Jan. 20, 1903, read a paper on dita bark (*Alstonia scholaris*) and Australian bitter bark (*Alstonia constricta*), two drugs belonging to the dogbane family. He also showed specimens of the bark and demonstrated the chemical and pharmacological actions of the crude drugs and their alkaloids. Dita bark was found in India, Malaysia and Australia. Strong sulphuric acid applied to the surface gave a characteristic pink color. It contained three alkaloids, ditamine, echitamine and echitenine, all belonging to one series. The first was the chief; it gave a pink reaction with strong sulphuric acid; in frogs it paralyzed muscle by coagulating its substance, and was found to act like curare in some respects. This must not be forgotten, for it might explain the fact why in large doses it had often been found to produce collapse. The tree yielding Australian bitter bark was found in Eastern Australia. The bark itself was brown, very bitter in taste and aromatic in odor. Strong nitric acid applied to the inner surface gave a dark red reaction, similar to the color produced by the same reagent on the bark on nux vomica. It contained four alkaloids: alstonine (formerly known as chlorogenine), porphyrine, porphyrosine and alstonidine. Alstonine was the most important of these. Commercial alstonine was mixed with resinous matter and was not crystalline, but the pure alkaloid could be made to crystallize. It gave a red reaction with strong nitric acid. A solution of the alkaloid in water, as well as a watery solution of the bark was fluorescent. In its pharmacology it resembled both nux vomica and quinine, but it had not so much resemblance to curare as dita bark or its alkaloids. Like quinine it paralyzed amebæ, rotifers, etc. On beetles, crickets and wasps it acted like quinine. In frogs, in medium doses, it acted like strychnine, but tetanus was not so marked or so universal. For the full play of symptoms both vessels and nerves must be intact. Its final action was to paralyze completely, evidently due to excessive activity. The therapeutics of the drug had been worked out by the Bancrofts of Australia and by Bixby of the United States. It was quite distinct in its action from dita bark, and acted on the skin, producing a mild diaphoresis. In the kidneys it increased the volume of the urine and toned up and slowed the pulse. The tincture was especially useful in influenza immediately after the acute symptoms had passed off. The pharmacopœial

dose was too large: one-half of the amount specified was enough and when prescribing the tincture that made from *Alstonia constricta* should be ordered.

JAMES MACKENZIE, at a meeting of the Burnley and District Medico-Ethical Society, held Jan. 8, 1903, read a paper on Pain. He defined pain as a "disagreeable sensation, due to stimulation of some portion of the cerebrospinal nervous system and referred to the peripheral distribution in the external body-wall of the cerebro-sensory nerves." This definition implies that the sensation of pain, from whatever source the stimulation arose, whether in the brain, in the spinal cord, in the posterior root ganglia of spinal nerves, in the viscera or in the external body-wall was invariably referred to the peripheral distribution of a sensory cerebrospinal nerve and that therefore pain was a phenomenon peculiar to the cerebrospinal nervous system. In the above definition, the division of the nervous system into a cerebrospinal and sympathetic was maintained, as the clinical facts pointed to the conclusion that the sensation of pain (and probably other sensations) did not arise from stimulation of the sympathetic nerves unless through the intermediary of the cerebrospinal nerves. Reference was made exclusively to the pain and associated symptoms arising from stimulation of the viscera. Experimental observations on animals were practically of no avail in determining this question. Such experiments as had shown the various organs to be insensitive proved only that the stimulus employed had not been adequate to produce pain. On the other hand, in such experiments as had demonstrated that the stimulus was adequate and the animal had shown pain, no evidence was available to determine in what region the pain was felt.

J. DOUGLAS STANLEY, at a meeting of the Midland Medical Society, held Jan. 21, 1903, showed the heart of a man, aged forty-seven years. The patient had complained for some time of recurring precordial pains which had extended down the left arm, of a tendency to faint, and of dyspnea. The cardiac sounds were feeble and short and the pulse was feeble, irregular and weak. The patient died suddenly, and on post-mortem examination extensive chronic aortitis with degeneration of the valves of the left side was found. The myocardium was abnormally tough and showed fibrotic changes. At the apex the wall of the left ventricle was very thin and showed a slight tendency to bulge, forming early cardiac aneurism.

B. G. A. MOYNIHAN, at a meeting of the Royal Medical and Chirurgical Society, held Jan. 27, 1903, read a paper on the Surgical Treatment of Gastric and Duodenal Ulcers, illustrated by a series of 50 cases. Dr. D'arcy Powers said that the treatment of gastric ulcer was passing through the same transition stage as had been seen in the treatment of hernia and intussusception. Because in some cases recovery took place without operation, that was no reason for postponing operation. He thought that in all cases in which perforation had taken place, operation should be performed at the earliest opportunity. He considered that drainage of the peritoneum was advisable and necessary in some cases, and he mentioned a case in which some eight or ten days after operation a subphrenic abscess had formed and the patient had died. He thought that in this case the patient might have been saved had drainage been resorted to. He thought that there was rather a tendency to overfeed the patient, with the result that vomiting was induced. He quite agreed with Mr. Moynihan that pyloroplasty was an unsuitable operation and should be abandoned, as the results were unsatisfactory. He considered that the accurate adjustment of the openings in the stomach and intestines was of great importance.

SOCIETY PROCEEDINGS.

THE MEDICAL ASSOCIATION OF THE GREATER CITY OF NEW YORK.

Stated Meeting, held at the New York Academy of Medicine, February 9, 1903.

The President, Andrew H. Smith, M.D., in the Chair.

Renal Decapsulation.—Dr. Leonard Weber presented a young man, twenty-one years of age, the subject of chronic Bright's disease. The urine had been persistently abundant and of low specific gravity (about 1.010), and contained a large amount of albumin. The patient suffered from repeated aggravated attacks of uremia, and might be said to have chronic uremia. Early in 1902, in spite of very large doses of tincture of ferric chloride, and the most energetic treatment by other measures, his condition became very bad. He was sent to the Post-Graduate Hospital on May 5, and on May 12 was operated on by Dr. Edebohls. Although the disease had then existed for eleven years, there was no atrophy of the kidneys. Both of these organs were of the mottled variety, and were about twice the size of the normal kidney. The capsule was easily detached. He remained in the hospital for one month, and on June 7 again came under Dr. Weber's care. Since then there had been no uremia whatever, and he felt so much better that he was able to do light work. The specific gravity of the urine still continued as low as before, however, and albumin was still abundant in it. (Specimens exhibited.) Dr. Weber referred to two other patients, brothers, who had been in almost exactly the same condition as this one, both of whom had died in uremic coma shortly before he was operated on, and said that at the time the operation was performed it seemed in his case also that the end must come very soon. Dr. Edebohls exhibited the cicatrices left by the operation, and said that the wounds always healed by primary union. No weakness of the back or other parts resulted from the operation. Before the operation the lower points of the kidneys had always been tender on external palpation, but no such tenderness now existed.

The Treatment of Chronic Bright's Disease by Renal Decapsulation: A Report of Progress.—Dr. George M. Edebohls read a paper with this title, to open a discussion on the address by Dr. William H. Thomson, at the annual meeting, January 12, on the Treatment of Uremia. He said that by persevering effort he had been enabled to see or get word from all the patients operated on by him, so that he could present the status up to date. The first renal decapsulation ever performed for the relief of chronic Bright's disease was done by him on June 10, 1892, and the patient was permanently cured. This case, together with reports of the five preliminary operations which led up to this procedure, was published in the MEDICAL NEWS of April 2, 1898. Subsequent papers giving reports of other cases of his own and a *résumé* of the work of other surgeons in this field were published in the *Medical Record* of May 4 and December 21, 1901, and of April 26, 1902. From 1892 to 1901, inclusive, Dr. Edebohls personally operated on 19 cases, and during the year 1902, on 32 cases. Of this total of 51 cases, 29 were in males, and 22 in females, and the average age was 34 years. In 32 cases the Bright's disease was far advanced. In 41 of the cases the period which had elapsed between the first recognition of the disease and the operation varied from one month to 19 years. The general average of this period was three years and four months, and in 32 cases it was fully four years. Nearly all the cases were attended by cardiac or other compli-

cations. Of the 51 cases, 29 were of chronic interstitial nephritis, and in all but nine only one kidney was operated on; 14 were of diffuse nephritis; and eight of parenchymatous nephritis. If only one kidney was affected by Bright's disease, he said, the patient suffered very little, and the condition might be discovered only accidentally.

Preparation for the Operation.—The chances of success for the operation are enhanced by the patient's remaining in bed for a week previous to it. This gives the heart a rest, if cardiac complications are present, and affords the best facilities for any preliminary treatment that may be required, as well as for systematic investigation of the quantity and condition of the urine. There are three conditions the presence or absence of which affect the facility with which the operation may be performed: (1) Great length and obliquity of the twelfth rib. This difficulty must be overcome by posture and a modification of the incision; (2) mobility or firm appearance of the kidney. When there is firm fixation it is generally necessary to incise the capsule at any point that can be reached. For separating the capsule the rubber-covered index finger is the best instrument; (3) the firm or more or less weak attachment of the capsule. Great caution and gentleness should characterize all attempts at decapsulation. In this operation there is often considerable danger of destroying some of the already diminished working tissue of the kidney, and it should never be performed except by surgeons who are already more or less familiar with renal surgery in general. The danger is greater from the condition present than from the operation itself. The procedure, however, should not be too prolonged; so that one hour should be the limit for the decapsulation of two kidneys. Dr. Edebohls has often found half an hour sufficient for operating on both organs. A "team operation" has been proposed, with two surgeons each working on a kidney, but this would hardly be feasible, as two operators, each with his necessary assistants, would inevitably interfere with the prompt accomplishment of each other's work. Another expedient suggested is that only one kidney should be decapsulated at a time; but this, too, is to be deprecated, as the time that the patient would be under an anesthetic for two separate operations would necessarily be longer than for operating upon both kidneys during one period of anesthesia.

Anesthetics.—In all but three of the operations the anesthetic used was ether, preceded by nitrous oxide gas. In three, nitrous oxide and oxygen were administered by Dr. Thomas L. Bennett. In one of these ether had to be used afterward, and finally chloroform, in order to prevent death on the table. This patient died twelve hours after the operation from acute dilatation of the heart.

Results.—Of the 51 patients operated on, less than one-half resided in the city of New York, 14 died, and the time of death after the operation ranged from 12 hours to eight years. A brief history of all these cases was given. Five died from uremia, and three from acute dilatation of the heart. Others, one of whom at least was cured of the nephritis, died from different diseases. Of the 14 cases, seven lived for periods ranging from two months to eight years, the average being nearly three years. The mortality shortly after the operation was 13⅔ per cent. Dr. Edebohls said that for one reason or another (the patients often begging him to operate) he had felt compelled to accept a number of cases in which death seemed a foregone conclusion. He gave them the benefit of the doubt, however, as surprisingly good results had been obtained in some other cases of the same kind. Some of these patients were physicians, who urged the operation at all hazards. In advising for or against operation, he said, each case must be judged on its own merits. The derangements of the heart and vascular system so commonly met with must always be taken into careful consideration. If cardiac hypertrophy be not too marked, or complicated too greatly by other conditions, it is not a contraindication. The case of a patient past sixty should be very carefully investigated, as the changes due to advancing years may render an operation inadvisable. Still, this is a relative matter, and many a person at seventy has a younger heart than others only forty or fifty years old. He divided the entire 51 cases into two categories; those operated on up to July 1, 1902, and those operated on during the last seven months. In the first class 24 cases were available for the study of results. In order to judge of these we must be familiar with the history and course of Bright's disease untreated or treated otherwise than by operation. From a study of this we find that there is often improvement for months at a time. To prove that a cure or substantial amelioration of the condition has been effected it must be shown (1) that there is a practical improvement, (2) that it is lasting, and (3) that it is steadily progressive. Only two of the 24 cases named have resulted unsatisfactorily. One is that of a woman who remained without any evidence of nephritis for nearly four years. Four years and 10 months after the operation (when the right kidney alone was decapsulated), albumin and casts reappeared in her urine. Notwithstanding this, however, she feels entirely too well at the present time to think of taking any step that would interfere with the activity of her daily life. The second case is that of a married woman, twenty-three years of age, both of whose kidneys were operated on in 1901. For eight months she showed considerable improvement, but during the last year she had an attack of diphtheria. Since then she has suffered from a succession of colds, and there has been no gain in her condition. Of the other cases, 10 have been radically cured and 12 greatly improved. Specimens of urine have been obtained from all but two of the patients.

Effects on the Urine.—As a result of the operation a steady improvement in the condition of the urine is observed. There is an increased daily output of urea, and a tendency toward a gradual return to the normal amount is shown. Of the casts, the first to disappear are those of the tubules; later the granular and hyaline casts also disappear. The albumin, which also finally disappears, remains for a long time after the casts cease to appear. Dyspnea and circulatory disease likewise improve in varying degree.

Cases in Physicians.—Eight of the cases operated upon were in medical men, who all believed that their only chance of living depended on renal decapsulation. Three of these died, in two there was only moderate improvement, and in the remaining three the results were most gratifying. Dr. Edebohls read letters from the last three, in which they described their cases and the results following the operation. The first physician, twenty-six years of age, felt greatly encouraged. There had been a gradual improvement in his condition, though he had had some acute exacerbations, the result of colds. The second, thirty-six years old, was operated on nearly a year ago. Since then he has had no dyspnea, and has never missed a day in attending to his practice. He stated that this was the first winter for three years in which he had not suffered greatly from cold hands and feet. He is also free from the headache, pains in the calves of the legs, palpitation of the heart, irregularity of the pulse, and feeling of weakness and lassitude which formerly troubled him. The third,

fifty-one years old, who had chronic diffuse nephritis, was operated upon on June 2, 1902. He wrote that he resumed work again on June 12. He has greatly improved, and now feels better than for five years past. In all these cases the urine has shown a steady tendency to return to normal. All Dr. Edebohl's patients but one report that their general health has improved along with the improvement in the renal condition.

Cures.—In order that a case may be pronounced cured fullest verification must be had of the disappearance from the urine of all albumin and casts for a period of at least six months. Among the ten cases cured there was one accidental death one year after the operation. The average period that has elapsed since operation is four years. Eight of the patients suffered from chronic interstitial nephritis. The cases of 1902 were as a rule of great severity.

Treatment of Uremia and Clinical Conditions.—Dr. F. P. Kinnicutt was convinced that any success in the treatment of the varied symptoms of uremia must be based upon an exact study of the clinical conditions in each individual case. A routine treatment for all cases, or even one method for the same patient in all attacks, is not only unscientific, but inefficient and often harmful. Dyspnea is most common in the interstitial forms of renal disease, probably from the almost constant arterial changes present. In addition, myo- and endocardial changes are often associated with the arterial degeneration, and an intelligent and effectual treatment of the symptoms must have for its basis a definite knowledge of the existing conditions. Where the predominating conditions are endarteritis and hypertrophy of the left ventricle, Dr. Kinnicutt's experience is that success in relieving the dyspnea will be proportionate to an ability to dilate the arteries. Among the arterial dilators nitroglycerin undoubtedly ranks first. Occasionally chloral hydrate will prove efficient when this fails, and the combination of morphine, given hypodermatically, with the arterial dilators will sometimes be more useful than the dilators alone. Where there is catarrh of the gastric mucosa, and even in cases in which the symptom is evidently due to toxemia, lavage often gives the greatest relief. Where the vomiting is associated with high arterial tension the vasodilators alone are often efficient.

Uremic Convulsions.—These may occur in acute nephritis in both the chronic parenchymatous and interstitial forms. When they are associated with acute renal disease, whether in children or adults, venesection gives the promptest relief and most enduring results. From a child of five years two to six ounces of blood may be drawn, according to the general condition. As this phenomenon is associated with a high arterial tension, nitroglycerin and chloral are useful. When there is a greatly diminished urinary secretion, intestinal irrigation with a normal salt solution of low temperature (100° F. to 105° F.) may also be of service. It is his practice to follow venesection by an intravenous injection of a saline solution of such a temperature, of double the amount of the blood withdrawn. In the convulsions of chronic parenchymatous nephritis the heart's action is usually feeble and the arterial tension low; so that vasodilators are contraindicated, and the best results can be obtained by the combined use of cardiac stimulants, intestinal irrigations with salt solutions of a high temperature (115° F. to 120° F.), and hot packs daily for considerable periods.

Oxygen and Alkalies.—Dr. Homer Wakefield said that Dr. Edebohls' operation increased the blood-supply of the kidneys, and he had no doubt that the increased amount of oxygen had a great deal to do with the good results obtained. He had treated uremia largely in connection with heart disease, employing oxygen and the Schott treatment, which acted to a considerable degree like the nitrites; the aim being to increase the renal blood-supply. He had also found the increasing of the alkalinity of the blood by means of colon injections of a saturated solution of sodium bicarbonate of great service. This, moreover, had a beneficial influence upon the heart and its action. He mentioned a case of general anasarca with uremia in which the patient in three days was completely relieved of the uremic and other symptoms by the use of such injections of the colon.

What the Edebohls Operation Appears to Accomplish.—Dr. Leonard Weber said that although the patient presented by him this evening had had chronic uremia for a year or more previously, he ceased to present the symptoms of it immediately after decapsulation of both kidneys, and had had no return of them since, notwithstanding the fact that his urine still remained as full of albumin as ever. How had such improvement been brought about by decapsulation in this and other cases? In his opinion, by the rapid growth of a vascular network spreading from the arteries of the fatty capsule upon and over the surface of the denuded kidney, and thus relieving the cramped and more or less obstructed circulation within the cortical substance, and collaterally carrying off venous blood and lymph through other channels beside the renal vein. Whatever regeneration of morbid epithelia, glomeruli and tubules may take place after decapsulation will occur in consequence of the relief which the hyperemic kidney obtains by the newly established collaterals at its periphery. To the theory that an improved supply of arterial blood by the ingrowth of arteries from the fatty capsule more or less deeply into the renal cortex will regenerate the diseased kidney Dr. Weber said he was unable to assent. His patient had not been cured of his nephritis, and he never would be. He also expressed his belief in the existence of such a thing as unilateral Bright's disease.

The Future for the Operation.—The President said that in chronic Bright's disease there was a deposit in the kidney all the way from the pelvis to the glomeruli. Consequently, the circulation from the center toward the periphery was very greatly impeded, as the blood had to be driven through vessels compressed by the deposit around them. But, as the result of the decapsulation devised by Dr. Edebohls, the blood was brought from the exterior directly to the glomeruli, and the ischemia of the organ was thus relieved. It seemed to him that the benefits to be derived from this procedure had only been foreshadowed as yet. As soon as the profession came to understand that the operative mortality from it amounted to practically nothing, it would be undertaken earlier and with much better chances of success; so that he could not but believe that the operation had a wonderfully hopeful future before it.

The Real Value of the Operation.—Dr. Edebohls said that the whole matter must resolve itself into one of experience. Before it is a settled thing three, four, or five years may be required. In the meanwhile, if those who have the opportunity to operate will follow up their cases with care, and if physicians will cooperate with the surgeons in the matter, the desired end will be the more successfully and quickly attained. After the operation the patients pass again into the hands of their medical attendants, and on the latter the obligation rests to study the subsequent course of the disease. If such studies are adequately carried out it ought not to take many years before a just estimate of the value of the procedure can be arrived at.

THE NEW YORK STATE MEDICAL ASSOCIATION, NEW YORK COUNTY BRANCH.

Regular Monthly Meeting held Monday, January 19, 1903.

The scientific business of the evening began with the presentation of specimens by Dr. J. Riddle Goffe and Dr. Parker Syms. Dr. Goffe presented a large polypoid tumor of the uterus which could not be removed in the ordinary way and for which supravaginal hysterectomy proved an ideal method. In cases of large polyps there is always danger of secondary complications of various kinds, but none occurred in this patient and recovery was prompt and complete.

Dr. Syms presented a loculated hydrocele which had been removed. The presence of the loculi was easily detected from the external appearance of the tumor and the existence of the partitions would make radical cure of the hydrocele by the ordinary method of evacuation by the trocar and the introduction of iodine inevitably a failure.

Acute Septicemia.—Dr. C. C. Barrows gave in brief a report of a case of acute septicemia for which intravenous injections of formalin had been given with excellent results. The patient was brought to the hospital with a temperature of 104.3° F. and a pulse of 140. A few days after admission the temperature rose to 105° F. Notwithstanding the employment of free irrigation of the uterus the temperature could not be made to stay down. After curettement there was a drop in the temperature, but it went up again and all the symptoms of general sepsis began to manifest themselves. Careful examination of the blood showed the absence of malarial organisms. No local lesions of the genital tract could be found and everything seemed to point to the fact that the patient would die from the continuous high temperature.

Injections of Formalin.—Under these circumstances, as a last resort an injection of 500 c.c. of a solution of formalin of the strength of 1-5,000 was given. This caused a drop in the temperature, but after 36 hours, it rose once more. At the end of 48 hours the second injection of formalin of the same strength, but this time of 750 c.c. in amount was given. This was followed by a slight chill. No other unpleasant symptoms manifested themselves, and the patient made no complaint. The injections were made directly into the vein of the arm. The second injection caused a drop in the temperature in a very short time, and since then there has been no further rise in temperature. Before the injection, streptococci were found in pure cultures in the blood, but since, none have been discovered either by the culture method or the microscope. Careful microscopical examination of the blood did not show any changes in the red blood cells as the result of the injection, and no blood was found in the urine nor was there an excess of blood pigment, that would have indicated an exaggerated destruction of red blood cells.

Previous Employment of Formalin.—This is not the first time in recent years that formalin has been employed for intravenous injections with therapeutic purpose. Dr. McGuire reported a series of observations made on himself and tuberculous patients with this drug. He first injected 50 c.c. of the equivalent of 1-5,000 formalin solution into his own veins with no bad results, though the substance could be detected in the urine. He then injected 260 c.c. of a 1-2,000 formalin solution without bad result. He found, however, that an injection of 1-800 formalin solution proved provocative of constitutional symptoms and was followed within a very short time by the occurrence of blood in the urine. After these experiments Dr. McGuire employed the formalin injections in the treatment of tuberculous patients from which he reported good results.

It would seem then, Dr. Barrows thinks, that the profession has in formalin an ideally harmless antiseptic which can be freely injected intravenously, and which will destroy micro-organisms without injury to the body cells. Dr. Barrows considers that while one case does not show definitely the value of the formalin solution it is at least suggestive of a line of work that may prove eminently helpful for a series of cases that thus far have been considered inevitably fatal.

Second Case—Dubious Result.—A second case in which the formalin injections were employed was reported for Dr. Silver, who was unavoidably absent. The patient's temperature as the result of an infective puerperal condition became very high, and on admission to the hospital was 105.5° F. For two weeks off and on it touched 105° F. many times. In order to bring the temperature down, hypodermoclysis of normal salt solution was employed and this caused a fall of temperature to 102° F. On succeeding days, however, the temperature rose again, though on one day after the administration of the injection of salt solution the temperature fell from 105° F. to 96° F. As the normal salt solution seemed to give only temporary relief, it was resolved to employ the formalin solution. By mistake this was employed in the strength of 1-2,500, and after 100 c.c. had been administered, the patient became comatose and a fatal immediate issue seemed inevitable. The patient recovered, however, without serious result. Afterward 750 c.c. of formalin solution, 1-5,000, was employed, and caused a decided drop in the temperature. The fall in temperature was not, however, any greater than when normal salt solution was employed.

Results of Injection.—Before the injection of formalin, streptococci were demonstrated as present in the blood, but after the injection they were not to be found. Careful examination showed, however, that the hemoglobin of the blood was lessened to a marked degree, and that the red blood corpuscles were shriveled and apparently lacking in vitality. Considering the after results and the efficiency of the formalin solution, which was practically no greater than that of normal salt solution, employed in the same way, the additional risks would scarcely seem to encourage the use of the formalin solution.

Third Case—No Result.—Dr. Bayner reported a case in the service of Dr. Briggs of St. Vincent's Hospital, in which formalin solution was employed to overcome a high temperature, evidently caused by the presence of a septic condition. The affection began as the result of a wound acquired in a domestic fracas. Before Christmas the woman's husband threw a spittoon at her and inflicted a bad scalp wound. This healed rather kindly, but she caught cold and some secondary infection seems to have taken place. About ten days after the accident her left knee became swollen and a condition of bronchopneumonia developed. About Christmas time and for five days afterward her temperature was 104° F. and streptococci were found in the blood. Notwithstanding the employment of all ordinary remedies, the fever continued to be high. Shortly after the announcements of Dr. Barrows' case 250 c.c. of formalin solution were injected. Soon after the injection the fever went up one degree. The next day the patient was improved. The improvement was noticeable mainly in the respirations, there being no drop in the temperature. As the temperature continued high, 750 c.c. of formalin solution were injected. One hour after the injection the patient's temperature rose to 106° F. Such a rise in temperature is not infrequent when large injections of even normal salt solution are made, so that

it should not be considered as particularly serious. No blood was found in the urine, nor was there any increase of blood coloring matters. In six hours the temperature dropped to 101.5° F., but the pulse remained at 150 and the respirations were above forty. The next day the temperature rose once more to 103 to 104 and, as the patient is constantly growing weaker, the outlook is for a fatal issue. In a word in the present case, the formalin injection does not seem to have been of any special benefit beyond what would have been derived from an injection of normal salt solution.

Blood Poisoning and the Streptococcus.—Dr. William R. Pryor said that in only 33 per cent. of the cases of blood poisoning is the streptococcus found in the blood. Its discovery does not necessarily mean a fatal prognosis. It has been found in some conditions, ordinarily not considered very serious. It occurs occasionally in tonsillitis, in rheumatism and at times too, in bronchopneumonia. The presence of the streptococcus is not so serious a sign and the important consideration is the extent of the local infective conditions from which the streptococcus finds its entrance into the blood. As is well known, the micro-organism may disappear from the blood without producing any serious symptoms and without having been specially treated.

Dubious Results and Cases.—In neither of the cases presented as having been more or less successfully treated by formalin injections, does Dr. Pryor think that a serious septic condition was present. There was nothing to indicate in the report of the cases that either patient had a purulent focus from which the streptococcus was being poured into the blood. Dr. Pryor himself has found that iodine seems to be the best antiseptic for cases of grave sepsis. Its presence in the blood can be secured by having iodoform disintegrate in contact with the tissues. If iodoform is placed in the serous cavity, iodine is set free and its absorption causes the death of the micro-organisms in the blood. Dr. Pryor has had this method of treating puerperal blood poisoning for some years at the City Hospital, and considers it the best that has yet been devised.

Varieties of Blood-poisoning.—Dr. Whitridge Williams of Baltimore said that he hoped that the injections suggested by Dr. Barrows will prove as useful as they seem to promise from the first case. The conclusions, however, must be accepted with much reserve. No affections are so liable to sudden variations as septic conditions. Dr. Williams has seen apparently hopeless cases, without any specific treatment, after a week of temperatures varying from 103° F. to 105° F. suddenly improve and then go on to uninterrupted recovery. In one case the temperature fell from 105° F. to 97° F. in a few hours. This woman had had miliary abscesses and other indications of having the micro-organisms in her circulation. The only therapeutic method employed was a uterine douche of sterile salt solution. A proper skepticism then with regard to any remedy suggested for puerperal septicemia seems very proper. It has taken many years to find out definitely that streptococcus serum is of no benefit.

Besides Dr. McGuire's investigations of the possibility of injecting formalin without harm he published the results of a series of hundred cases of tuberculosis in which this remedy had been employed. His observations were exploited by the newspapers and caused considerable excitement. The newspapers continued to revert to the subject until finally eighteen months later, Dr. McGuire himself announced that the results in subsequent cases had not been satisfactory to him, and that he was not ready to recommend the remedy nor to publish anything further with regard to it, until his invstigations were more complete.

Other Antiseptics.—At Budapest it was suggested some years ago that dilute solutions of bichloride of mercury, would be useful for septic conditions. Subsequent investigators did not find them as beneficial as the discoverer. Some of the silver salts have been used with excellent effect according to claims of investigators. The use of silver nitrate intravenously has in some conservative observers' hands produced excellent results. Dr. Williams has seen it employed several times without producing any effect. The beneficial result when solutions of the silver salts are employed is due to the occurrence of leucocytosis. When employed by Dr. Williams there has been no leucocytosis and consequently no improvement in the patient's symptoms. As a matter of fact it is not so much the micro-organisms in the circulation as the fresh supply of them constantly given from the local focus of suppuration, that causes the danger and the symptoms in the case.

Danger of Curettage.—Dr. Barrow and others mentioned that the curette was employed in their cases before the formalin solution was introduced into the circulation. Dr. Williams considers this a most nefarious practice. It certainly kills far more than it saves. Nature's efforts to shut off the micro-organisms from admission into the circulation are rendered abortive, fresh absorbing surfaces are exposed, and as all of the septic material cannot be removed, no ultimate good is done. If there are streptococci in the uterus, then the practice is especially dangerous, if only putrefactive micro-organisms are found, and if there is a considerable quantity of material in the uterus, this may be removed with the finger, which is better than any instrument and gives better assurance of complete removal. The use of the curette is certainly to be deprecated, and should not be taught as is commonly the custom.

Last Resort.—Dr. Polk said, in discussing Dr. Barrow's paper, that the question of the injection of a dilute solution of formalin, reminded him of a discussion in the Academy a quarter of a century ago, when it was suggested that the use of carbolic acid would cure puerperal fever. Since then many antiseptic methods have been tried and some relief of symptoms has been found in recent years by the use of the salines. Now that it is definitely known that a potent antifermentative can be introduced directly into the circulation, it would seem that a remedy very hopeful at least has been put into the hands of the physician. While it can do no harm, it may do good and, as a last resort, represents the promise of a distinct step forward in therapeutics.

In closing the discussion Dr. Barrow said that the condition of the patient seemed hopeless, and that there was question of the employment of any remedy that might possibly do good. Under these circumstances the good result that followed the use of formalin seemed to justify the very highest hopes, and to vindicate a place for the treatment in the hands of the general practitioner in these serious and usually fatal cases.

Significance of Oxaluria.—Dr. J. Bergen Ogden read a paper in which he discussed our present knowledge of oxalates in the urine. Since the experiments and observations of Dr. Helen Baldwin in Dr. Christian Herter's Laboratory show that oxaluria occurs in animals if there is excessive fermentation in the gastro-intestinal tract. This paper will be published in the MEDICAL NEWS.

Hyperacidity of the Urine.—Dr. Thomas W. Hastings said that febrile conditions and an excess of meat eating lead to hyperacid urine. The old idea that excess of acid in the urine precipitates the urea and phosphates, is false. It must not be forgotten that there may be an amphoteric reaction in the urine, because of

the presence at the same time of salts that act as acids and alkalies to litmus paper. The only reagent that can be depended on to give the reaction of the urine with certainty is phenolthalein and a decinormal solution of sodium hydrate. This paper will be published in the MEDICAL NEWS.

Prognostic Value of Diazo Reaction in Tuberculosis.—Dr. Frank C. Wood gave the results of the study of 363 cases of tuberculosis with reference to the presence of Ehrlich's diazo reaction in their urine. Of the 117 patients who died, 81 had a positive diazo reaction. Of the 246 discharged 22 were discharged for reason and had no effect upon the statistics. Of the remaining 224 over 90 per cent. had no diazo reaction. None of the early cases presented it, so that the diazo reaction seems to present a fairly accurate prognostic test in tuberculosis. This paper will be published in the MEDICAL NEWS.

Careful Living and Long Life.—Dr. Edward W. Lambert read a paper on the prognostic significance of albumin in the urine. He said that under present circumstances the main factor in the shortening of life was not so much any hereditary weakness of tissue as injudicious living and the excessive wear and tear of business. The worry of getting rich shortens more lives than any other single factor that may be mentioned almost. In our time, however, excesses in the use of alcohol and tobacco are sure to bring in their train degeneration of important structures that preclude the possibility of long life. Very often the first hint of this tissue degeneration is found in the kidneys. The first sign of it is usually albuminuria, but the presence of albuminuria does not of itself always have so serious a prognosis as is sometimes thought. In Dr. Lambert's judgment no healthy man has albumin in his urine, there is always something out of gear and yet the condition may not be serious and may be only passing. The most prominent causes of albumin in the urine are undoubtedly extremes of cold or heat. The disturbance of circulation due to these factors leads to congestion of the kidneys and this causes the leakage of albumin through the renal tissues. The albuminuria due to these causes is only temporary and not of great significance, though it may be considerably more than a trace in amount. It is possible, however, for the kidney irritation which allows the escape of albumin to be prolonged for a sufficient length of time to produce tissue changes, or beginning degeneration at least and this, in course of time, and as the result of exacerbations prove progressive until a serious kidney condition is established.

Dr. Osler took occasion in a paper not very long ago to call attention to a number of cases in which patients who had been refused life insurance because of the presence of the supposed pathological condition of their urine had yet lived for many years after refusal of insurance seemed to foretell a near demise. He expressed the opinion that the decisions of life insurance examiners were entirely too arbitrary in this matter, and that undoubtedly too much care was exercised in the selection of risks to the exclusion of really healthy persons. Dr. Osler's cases, however, only furnished the evidence of the few who survived. The statistics of the many who refused for practically the same reasons, died within a few months, or at most a few years, are known as a rule only to the insurance companies.

Albuminuria and Life Insurance.—For twenty years Dr. Lambert has insisted on the prognostic value of albuminuria as an index for life insurance. The mere presence of albuminuria can not always be considered of unfavorable prognosis and sometimes the condition is a most difficult one to appreciate. The significance of albuminuria is always a difficult problem to appreciate. Dr. Lambert told the story of two partners, successful business men, who applied for life insurance on the same day. One of them had so small a trace of albumin that after filtration its presence could scarcely be detected, even when all the conditions favorable for its recognition were fulfilled. The other partner had a considerable amount. The second applicant was refused absolutely. The first after repeated examinations never presenting more than this very slight trace of albumin was considered to have physiological albuminuria and was given a policy. The successful applicant died in eighteen months. His partner lived for twenty-five years.

Anomalous Cases.—In one applicant for life insurance, who asked for the highest policy the company was then giving, and who presented himself about three in the afternoon, a distinct trace of albumin was found. The patient was indignant, went to his family physician, a very prominent medical man, who asked for a sample of his morning urine and could find no albumin. He wrote to this effect to the company. Another afternoon sample showed the presence of albumin, and though many examinations of the morning urine showed no trace of its presence, the afternoon urine always proved to have albumin. The applicant was finally refused. The patient died five years later from cerebral apoplexy, the indirect cause of which was chronic nephritis. In signing the death certificate his family physician stated that the indirect cause of death was chronic nephritis, which he had known to exist for five years. It is evident then he had come around to the insurance company's way of thinking.

Albumin and Casts.—Dr. Lambert said that in young men particularly the occurrence of albumin, even with a certain number of casts, is not necessarily significant of true nephritis. Not infrequently curious hyaloid bodies with club-shaped ends gradually running to a point at the other end are found. At times too, these casts contain mononuclear cells that evidently have their origin in the kidneys. These may disappear, however, without leaving any trace of their having been present. For such patients, their mode of life, especially highly seasoned food, large financial operations, loss of sleep, nature's sweet restorer, make the prognosis much more serious than the presence of albumin.

Albuminuria and Long Life.—Dr. S. O. Vanderpoel said that during the last fifteen years many applicants have been refused life insurance because of the presence of albumin in the urine, and yet after over ten years are still alive. If the whole list of those refused for this reason, however, be taken, it will be found that the death-rate among applicants refused is four or five times as great as that among applicants of the same age and expectation of life. The unfavorable prognosis is least in simple albuminuria. In such cases life may be continued for many years with proper care. A broker who applied for insurance in 1875 had no albuminuria. In 1878, on reapplication for further insurance a trace was found. Many times during the next fifteen years, albumin was found to be present. He died after nineteen years, having fulfilled only one-half his expectation of life. In the meantime any serious illness would surely have carried him off. Dr. Vanderpoel said that we do not as yet know the true significance of albumin in the urine. Nucleo-albumin, for instance, is practically of unknown quantity. There is room for most interesting and valuable investigation in this matter. Nucleo-albumin, for instance, probably has a very definite significance, for it is known to occur in eclamptic cases. Albumin alone is not so significant as albumin and casts, and yet the mere presence of

even a trace of albumin means a lessening of the expectancy of life.

Dr. Porter said that most family practitioners either disagree with the insurance examiner with regard to the significance of albumin, or lessen the effect of the applicant's refusal by making little of it. Nothing better could happen to a man who has albumin in his urine than to be refused for life insurance and thus have impressed upon him the necessity for careful living. Such lives are invariably longer for the warning thus impressed upon them.

NEW YORK NEUROLOGICAL SOCIETY.

Stated Meeting, held February 3, 1903.

The President, Pearce Bailey, M.D., in the Chair.

Paradoxical Pseudohypertrophy in Infantile Cerebral Hemiplegia.—Dr. L. Pierce Clark presented a boy of ten years with a family history of epilepsy, insanity, alcoholism, rheumatism and tuberculosis. The personal history was good except that when five years old he had suffered from a severe attack of smallpox. This had been followed by infantile cerebral hemiplegia, the convulsions being general and lasting for hours. A left hemiplegia was noticed the day after the convulsion. Three months after the initial stroke he had *status hemiplegicus unilateralis* attended by high fever. There were 74 *grand mal* fits in four hours. At present there were from three to five epileptic attacks daily with an epigastric aura. Hypertrophy of the calf on the paralyzed side was first noticed three years ago, but the left arm was moderately atrophic. The ankle also showed bony hypertrophy, a still rarer condition.

Case of Myoclonus.—Dr. Clark presented a Jewish boy of eleven years having a negative family and personal history. Two years ago without known cause a spasm developed in the left biceps, triceps, pectoralis major, latissimus dorsi and sternomastoid muscles, and in a few weeks the same muscles in the right side became involved. The spasm was clonic in character and occurred from twenty to forty times a minute, with never more than a few minutes of entire freedom from the spasm. In a few months the muscles of the pelvic girdle became affected, particularly the glutei, quadriceps and sartorius. Arsenic had been of no avail in suppressing the spasms. No spasms had been observed in the fingers or toes. The musculature was good, and there was no atrophy or sensory change. All the reflexes were normal. The diagnosis of myoclonus was made on the bilateral, clonic, lightning-like character of the spasms of the proximal muscles.

A Case of Multiple Neuritis with Intact Reflexes.—Dr. Clark also presented this case, a child of five years, an imbecile and possibly epileptic. The boy had apparently had an attack of meningitis last July. He now presented the high-stepping gait and the exaggeration of all the reflexes. There was a marked diminution in the response to the faradic current. At present, he was in the recovery stage of multiple neuritis, apparently of lead origin.

Dr. J. Ramsey Hunt asked if in the case of myotonia there was a history of fright; also if the term, myoclonus, was used in the generic sense. The case had much in common with Henoch's chorea.

Dr. W. M. Leszynsky asked on what basis it was concluded that the multiple neuritis was due to lead. The distribution corresponded more to that of alcohol, and from the fact that the child had been taking beer, the probability was that it was an alcoholic neuritis.

Dr. Clark said that he looked upon the case of myoclonus as of the Friedreich type. The history of fright usually had to be taken with a good deal of allowance. He did not think it could be of the choreic type referred to because muscular atrophies occurred and ran a rapid course. The condition was not improved by the usual treatment for chorea. The case of multiple neuritis was first thought to be one of alcoholic origin, and an effort was made to obtain such a history, but the history of beer drinking was not at all satisfactory or definite. The child had been playing around a cellar and had freely dabbled in lead paint a short time before the illness.

A Case of Myokymia.—Dr. R. M. Daly presented a man of twenty-eight, a printer by occupation. There was no history of lead colic, and no family history bearing upon the case. For years he had engaged freely in athletic sports. About one year before coming under observation, after having walked for eleven hours, the calf muscles began to twitch. When first seen, last October, his general condition was good, as were also his habits. His gait and station were normal, and there was no paralysis of the muscles. Facial innervation was more marked on the right side. There was a fibrillary twitching of all the muscles of the legs and of the posterior muscles of the thigh. Sometimes the same bundle of muscular fibers would contract several times in succession. A blow upon the muscles brought out the contractions well. The electrical contractions were negative. There had been no evidence of atrophy during the time the patient had been under observation. There was no disturbance of the special senses, and the superficial reflexes were undisturbed. The knee-jerk was increased; there was no clonus or Babinski. He had received increasing doses of strychnine and arsenic, and had received galvanic and X-ray treatment, but all without benefit. Quite recently he had been placed on gelsemium, and the twitchings had diminished somewhat.

Dr. C. L. Dana said that while the condition was neither important nor grave, he thought it was of interest to recognize it as a distinct symptom. Fibrillary twitchings were common enough in states of exhaustion of any kind. Myokymia occurred in neurasthenic states, and sometimes also in alcoholics.

Non-Septic Cerebritis.—Dr. Harlow Brooks read this paper, reporting a case. He said that these cases had not been frequently reported in recent medical literature, and hence, the case he had seen seemed to be worthy of reporting. The disease was not so very rare, but it was the exception for it to be recognized because of our scanty knowledge regarding it. Microscopical examination in a considerable number of instances had been found to be the only certain method of recognizing the condition. A considerable number of cases recovered wholly or partly. The cases going on to recovery were apt to be set down as examples of hysteria. Metabolic poisons and those toxins produced by the growth or action of bacteria should be just as competent to produce inflammation as injuries. In all inflammatory diseases the question of the occurrence of hemorrhages depended upon the severity of the inflammation and the situation of the lesions. He had no sympathy with those who insisted that an inflammation was necessarily dependent upon bacteria or their products. Acute encephalitis might terminate in death if the disease involved parts of the encephalon essential to life. When complete recovery ensued it was probable that the inflammatory products were almost completely absorbed. When there was only partial absorption there would be more or less impairment of the functions of the brain. Such a condition not infrequently occurred in alcoholics or after severe attacks of insolation. The following case was then reported: The patient was a girl of nineteen years, by occupation a domestic. There was a history of headaches and bilious attacks. She was naturally

rather dull. On the night previous to her entrance to the hospital she appeared to be as well as usual, but was found unconscious the next morning, and was thought to be suffering from poisoning. On admission, she was unconscious, and the respirations were stertorous. In response to pin-pricks the hands and feet were withdrawn. The pupils were moderately dilated and reacted somewhat irregularly to light. She was unable to swallow and did not respond to the usual forms of stimulation. Kernig's sign was absent. On October 21, or two days later, the urine was normal except for a trace of albumin. The temperature varied between 100° F. and 101° F. Two days later some casts were found in the urine. On October 25, a bed-sore appeared to be forming over the sacrum, and the temperature was rising. There was a leucocytosis of 14,000. On October 27 the patient took two ounces of water by mouth, but with this exception all nourishment had been by rectum. On October 30 she spoke once, as she had done on the previous day. The bed-sore was getting rapidly worse. On November 1 she spoke rationally and complained of pains all over. Some nourishment had been taken by mouth. She was very uneasy during the night. On November 6 the temperature varied between 102° F. and 105° F. and the pulse between 140 and 160. She died with a temperature of 106° F. Several blood cultures were taken before death, and these proved negative. An examination of the eyes was also negative. The necropsy was begun two hours after death, and was conducted by Dr. Janeway. Nowhere in the body was there any inflammation except, of course, in the bed-sores. Slight cerebrospinal meningitis was found of the cellular type. There was also a general non-septic cerebritis, most marked in the cortex and particularly in the motor area. There was degeneration of many of the ganglion cells in the cortex, apparently of recent origin, and of many of the fibers arising from the large pyramidal cell layer of the cortex. There was diffused degeneration of many of the fibers passing through both internal capsules, and limited to no particular portion of the capsule. There was inflammation of the tissues of the cerebellum, though to a much less degree than in the cerebellum. There was degeneration of many of the descending fibers of the pons and medulla. There was also degeneration of the chief descending tracts of the spinal cord and of some of the fibers in the ascending tracts. There were cytoplasmic changes in the ganglion cells of the anterior horns of the spinal cord. The examination showed the case to be one of organic and not functional disorder. It seemed safe to assume that the cause was not an infection, and the almost unavoidable conclusion was that the lesions were of toxic origin, possibly bacterial. The patient had been in the habit of taking headache powders, and it was possible that this was responsible for the cerebritis.

Dr. J. Arthur Booth said he had seen this girl a few hours after her admission to the hospital, and had also been present at the autopsy. She was deeply comatose and there was absolutely no previous history. The pupils were moderately dilated and they reacted to light. There was absolutely no response to pin-pricks except in the feet and hands. He had been unable to make a diagnosis. At the autopsy, the brain appeared to him normal except that it was rather soft.

Dr. B. Sachs preferred to speak of this condition as a non-suppurative encephalitis. He had tried in a number of instances to recognize these cases and differentiate them from other cerebral conditions, particularly from apoplexy. However, he had found it extremely difficult to make the differential diagnosis. In children there was a special type in which the patient passed slowly into a state of unconsciousness, and remained there for some days or weeks, when consciousness was slowly regained. After this the most striking symptom was a persistent aphasia, though the general clinical picture was that of a cerebral hemiplegia.

Dr. W. M. Leszynsky said that he had had an opportunity of examining this girl about one week before her death. At that time her condition was similar to that described by Dr. Booth. He learned that the rise of temperature had been coincident with the progress of the extensive sloughing bed-sore, and it was evident that the patient was then suffering from general sepsis. He was disposed to think that this condition of general sepsis must have had considerable influence upon the post-mortem findings. He recalled a case in which a woman had remained unconscious for three months, requiring to be fed by the stomach tube during this time. Her condition was supposed to be due to ovarian trouble, and as at that time the fashion was to remove the ovaries for slight cause, both of her ovaries were removed without much benefit. She regained consciousness after the operation, and described her condition during the unconscious state. She died shortly afterward, and the post-mortem findings failed to throw light upon the nature of the case.

Dr. Joseph Fraenkel said that the existence of non-purulent encephalitis had been proved in the monograph of Oppenheim. He would adopt Oppenheim's teaching with regard to these cases. The absence of the usual etiological factors, the presence of only very slight focal symptoms and the presence of fever should lead one to think of the existence of non-purulent encephalitis.

Dr. Joseph Collins said that he was inclined to diagnosticate acute hemorrhagic non-purulent encephalitis rather frequently—indeed, it was rare for a week to pass without this diagnosis being made. It did not seem to him that there was very great difficulty in making the diagnosis. For instance, a child of two and a half years had been seen at his clinic that day. A short time ago it had become dull, inactive and irritable, and somewhat feverish. On the second day there was a convulsion lasting three-quarters of an hour, most marked on the left side. After the child had remained stupid for ten or twelve days it gradually regained its normal activity. On examination, there was a condition of hemiparesis with normal mentality. This case seemed to him a very clear one of non-suppurative encephalitis. In the class of cases referred to by Dr. Sachs he had never seen any rise of temperature, nor was there that degree of recovery which seemed to him so essential to justify the diagnosis of non-purulent encephalitis. He thought it was about as frequent as pneumonia, and the analogue of it. He had very grave doubt about the case reported by Dr. Brooks being one of non-suppurative encephalitis. There must have been just as great changes in the spinal cord as in the brain otherwise there would not have been such a rapid and extensive development of bed-sore. It was possible that there was present some intoxication that had not been revealed by the investigation, and which might explain the symptoms and the cause of death in some other way. The clinical description seemed to point to encephalomyelitis.

Dr. R. H. Cunningham said that he had seen two somewhat similar cases. One of them was in Mount Sinai Hospital many years ago. The history was that the young woman after a disappointment in love had begun to be sleepy and stupid, and then became unconscious. Pin-pricks or faradic stimulation of the skin caused some response at first, but in a few days she became deeply comatose. The temperature was moderate for a few weeks, and then it suddenly rose and death soon ensued. The autopsy findings were negative. He had examined some sections of the brain and spinal cord, and had found leucocytes surrounding the blood

vessels. The Weigert method showed absolutely no change. The diagnosis at that time was subacute cerebritis. In 1895 he had seen a similar case, occurring in a school girl. The symptoms and course were about the same, but death occurred in about two weeks. The autopsy findings here also were negative. The microscopical examination of the brain gave exactly the same results. These findings were certainly not characteristic of any one disease.

Dr. Brooks said that undoubtedly the patient became septic from the large bed-sore, but this was so shortly before death that the autopsy did not show the changes which were ordinarily observed in the organs under such conditions. On admission, the patient had fever, and the bed-sore did not develop for a week or ten days afterward. If there were a septic condition arising from the bed-sore there would have been a general infection of the blood, and various micro-organisms would have been found in the blood, yet a very competent bacteriologist failed to find any such condition. All of the classical stages of inflammation were represented in the brain. He had made careful sections of the cord, but had been unable to find the inflammatory process which one would naturally look for as the cause of the bed-sore.

Case of Myoclonus Multiplex Friedreich.—Dr. J. Ramsey Hunt reported a case of this kind that he had seen in July, 1901, together with the autopsy findings. The man was forty-five years of age, a tailor by occupation, and a man of good habits. A few months before admission to Bellevue Hospital one knee had been operated upon for tuberculosis. The peculiar tonic contractions of the muscles began some months previously. There was a history of despondency from financial straits. The muscles of the arms and legs, and of the shoulder girdle showed very active twitchings. The whole muscle would bound forward as if by an electrical stimulation. No tetanic contraction was detected. The face muscles showed none of these contractions. The latter were most active when the patient was recumbent. The isolated contraction of individual muscles, such as the supinator longus and the sartorius, was the most noticeable feature. Sensation was undisturbed. The tendon and skin reflexes were very active. There were no stigmata of hysteria, and no evidences of mental impairment. A few weeks later he developed fever, and died apparently of general tuberculosis. The myoclonus persisted throughout the acute febrile attack and for fifteen minutes or more after cardiac pulsations had ceased. A careful examination was made of the Rolandic and other areas of the cerebral cortex, of the spinal cord at different levels by all of the usual methods, but with negative results. The affected muscles showed an unusually marked hypertrophy. The transverse striations were normal. In some places a central position of the nucleus of the sarcolemma sheath was noted.

Case of Chronic Tic, with Remarks on the Classification of Myospasms.—Dr. Charles L. Dana read this paper. He said that apparently no case had been observed in England, Scotland or Ireland, whereas 14 cases had been reported in this country, and two other cases had been reported under a different name. After carefully reading the descriptions he had come to the conclusion that no case of paramyoclonus of Friedreich had been reported in this country, not even the case just reported by Dr. Hunt, although it came nearer to that type than the others. The speaker then reported a case of paramyoclonus like those that had been published by other American observers. The patient was a man of forty-two with a history of the mother having had similar attacks during the time she was pregnant with this son. The man said he had been healthy until the age of eleven years, when he had been rendered unconscious by the kick of a horse. Shortly after this the first attack of myoclonus developed. The trouble continued with various remissions for the 23 years which had elapsed before coming under Dr. Dana's observation. When first seen he was nervous, anemic and badly nourished. There was no disorder of the sensory sphere. When the attacks came on he was seized with rhythmic movements of the head, and the hands and feet quivered. During the attack there was considerable palpitation of the heart; he perspired profusely and became exhausted. These contractions came on at very short intervals, and were apt to last for several days unless he took some narcotic, when the attack would cease. The patient had not been improved by any treatment he had employed, including hypnotism. A short time ago the patient reported that his general health was much better, and that the attacks were milder and less frequent. Myoclonus multiplex, Dr. Dana said, occurred also in connection with epilepsy. Mention was made of a case of myoclonus that had been under observation for a number of years. The attacks had developed after an operation on the thyroid gland following an abscess. The contractions were both clonic and tonic, and involved practically the whole musculature of the body. He looked upon the case as a mixture of chronic chorea and tic. Myoclonus occurred in association with epilepsy, chorea, tic and paresis; it also occurred in family forms. All these types of myoclonus were distinctly degenerative types of moble spasm. There was another group of myoclonus multiplex which occurred in the form of recurrent spasmodic attacks, although sometimes the attacks were continuous. The trunk muscles and the proximal segments of the body were chiefly affected, and the contractions were very violent and of a rhythmic character. These cases had been called hysterical myoclonus, but in the cases he had seen there had been no distinct evidence of hysteria. Fright or shock was a common etiological factor; his own case was of the family type. The cases reported by American observers approached more closely to a disease entity than did the case of Friedreich. He was inclined to think that the case of Friedreich belonged more properly to the class designated as myokymia. There had been reported cases of paramyotonus which ran a course quite comparable with that of paramyoclonus.

Dr. B. Onuf said that it was difficult to determine from the clinical reports found in the literature whether the muscles were hypertrophied or atrophied, and the subject was still further confused by the variations in the muscle fibers resulting from the use of various hardening fluids.

Dr. L. Pierce Clark believed that Dr. Hunt's case was a typical one of myoclonus. It was very evident that others had not met with Friedreich's type. In some recent experiments the injection of carbolic acid into animals produced a condition of myoclonus multiplex. Recovery almost never took place in a well marked case. The fact that over half of the cases reported had been associated with some form of disease, especially cortical, would seem to place the disease as cortical and not muscular. The treatment that he had found the most valuable consisted in the alternate use of bromides and chloral, with venesection and hypodermoclysis or enteroclysis at the time of the attacks. In many respects the symptomatology of myoclonus simplex and status epilepticus was similar.

Dr. Hunt said that the examination of many supposedly healthy muscle fibers had failed to reveal any like those in his case, the fibers in the latter being almost double the size of normal ones. It was not mentioned as an essential, but as an interesting finding. In his opinion, the distinguishing feature of myoclonus of

the Friedreich type was the occurrence of contractions of individual muscles not under the control of the will except in conjunction with other muscles in the performance of coordinative acts.

Dr. Dana said that it was evident that we were dealing with two very widely different diseases, one represented by the case reported by Dr. Hunt, and the other, the myoclonus epilepticus described by Dr. Clark, and characterized by very violent contractions and coordinate movements. Dr. Clark had shown that the myoclonus of epilepsy was distinctly a cortical disease.

BOOK REVIEWS.

OPHTHALMIC MYOLOGY. A Systematic Treatise on the Ocular Muscles. By G. C. SAVAGE, M.D., Professor of Ophthalmology in the Medical Department of Vanderbilt University. Published by the Author. Nashville, Tenn.

THIS is the most thoughtful and painstaking piece of ophthalmic literature brought out in recent years, whose merit rests on scientific investigation and clear logical statements. This applies especially to the principles worked out in the first chapter in the study of the "law of corresponding retinal points," the "law of direction" and Listing's plane, the last of which he repudiates, correcting the law. His study of cyclophoria is exhaustive, an excellent contribution to the literature. The language is clear and crisp and his style at times almost epigrammatic.

The paradox of his dictum "After all that has been said, there are two kinds of orthophoria," melts away into the terms *sthenic* and *asthenic*. Yet all of this, we think, the author would regard as subsidiary to the main purport of his book, the elaboration of a perfect plan of treatment of heterophoria. The plan is perfect, but we believe it is based on a wrong principle and cannot endure. His logic is correct; but with an unusual premise, the conclusion of the book as a whole is unsound. The author makes a clear issue when he states of heterophoria "*The treatment*, whether operative or otherwise, *must be directed to the muscles.*" In the interest of truth we oppose this proposition, but only with fair criticism. Therefore we dissent from the *British Medical Journal's* review (Dec. 27, 1902) which says "Here is a book of 567 pages dealing *only* with the function and abnormalities of the *extra-ocular* muscles." The reviewer culpably uses "only," since Chapter XII is devoted to "muscles of the iris and ciliary body," an instructive chapter omitting ophthalmoplegia. "*Extra*-ocular" may be a provincialism, but it is too loose and inaccurate a term to be sanctioned. Without a single appreciative reference to anything in the book, the reviewer makes a contemptuous fling at the author for having busied himself in making so ponderous a volume on a class of cases of which, according to him, "little is seen" in England. What if the book does remind him of Ranney's, should that debar it from consideration on its merits? The reviewer owes courtesy or at least fairness. Yet, if we are not mistaken, the very discourtesy here rings with a true note. The book repels the reviewer; it starts on a wrong basis and is therefore an unsafe superstructure. We can comprehend his feeling but cannot on that account excuse his manner. Besides, we think the subject worthy of all the attention our author has given it. He believes in doing things well, just as Maddox did. We are far from thinking the author has failed to be impressed with the wonderfully delicate and sensitive adaptation of means to ends in Nature's attachments of these muscles, though his plan of practice assumes an anatomical defect in them notwithstanding they are less interfered with than others by adventitious mechanical disturbances.

General prevalence of disturbances of function of the ocular muscles does not excuse the serious error in practice of basing treatment on assumed anatomical defect when inequality of muscle-function is found. Profound respect is due to the attitude of Vesalius toward the law of persistence of anatomical structure and sufficiency. Tenotomies have often done good just as other kinds of practice on unsound principles have turned out well at times. The explanation does not lie here. Gould and others have pointed out that innervation is at fault. Varying states of health in the same individual gives corresponding changes in these muscle tests. Removal of certain faulty conditions in healthy subjects with muscle imbalance restores the muscle balance. Proof in this direction is cumulative. Failure in the other direction is inevitable.

DIE NEUEREN AUGENHEILMITTEL FÜR AERTZE UND STUDIERENDE. By Dr. M. OHLEMANN, Wiesbaden. J. F. Bergmann, Wiesbaden.

IN 1899, Dr. C. A. Oliver edited a translation of Dr. Max Ohlemann's "Ocular Therapeutics" to make it available to English readers. Dr. Ohlemann has now, after the lapse of five years since the preparation of his former work, brought out a new volume on "The Newer Ocular Therapeutics," in which some of the subjects treated of in his former volume are dealt with more comprehensively. Asepsis and antisepsis have a separate chapter. The therapeutics of individual eye-diseases, which formed the bulk of the former work, is not taken up in this. Instead, therapeutic measures applicable to treatment of eye-diseases are taken up in their general characteristics. The newer applications of electricity are given, including radiotherapy. Serumtherapy receives full consideration. This valuable complement to the former work might well receive an English translation to accompany its predecessor.

INTERNATIONAL CLINICS. A Quarterly of Illustrated Clinical Lectures and Especially Prepared Articles on Medicine, Neurology, Surgery, etc., by Leading Members of the Medical Profession Throughout the World. Edited by HENRY W. CATTELL, M., A.M., M.D., J. B. Lippincott Co., Philadelphia.

THE present volume of the International Clinics contains as usual some very interesting practical articles. The treatment of chronic gastric catarrh by Dr. Heinrich Stern of New York contains some excellent diagnostic points and some good practical therapeutic hints. A posthumous report of a case of pernicious anemia with extensive pigmentary changes in the skin by the late Frederick A. Packard of Philadelphia, is a sad reminder of the loss to American medicine by the untimely death of this promising eminently conservative and thoroughly scientific young man. Dr. Lawrence Flick, of Philadelphia, has an excellent article on the differential diagnosis between tuberculosis of the lungs and diseases which resemble it.

In the department of surgery, Dr. Fallon of Worcester, Mass., has a series of plates made from dissections of the inguinal region and meant to serve as guides in the operation of radical cure for inguinal hernia that are as perfect illustrations of their kind as we have seen. The volume closes with a hundred page article on the blood in health and disease, with a review of the recent important work on this subject by Dr. Thomas R. L. Browne of Johns Hopkins University, Maryland, that is well worth reading in its entirety.